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On the Coins of the GUPTA Dynasty.—By EDWARD THOMAS, Esq.,
B. C. S.

Of the numerous coins, contributed by India at large, so admirably delineated by James Prinsep, and published in the early volumes of the Journal of the Asiatic Society of Bengal, the great majority were either conclusively deciphered and attributed by that versatile scholar, or advanced some stages towards such eventual explication and assignment. One of the few exceptions to this, almost unvarying success, presents itself in the class of money, I am now about to notice.

I refer to the small silver coins with the *reverse* device of a Peacock* of the type associated with the recognised Saurashtran model.

Prinsep, while he correctly classed these pieces, in virtue of their typical assimilations, freely admitted that he was unable to master their legends; neither has Professor Wilson afforded us any assistance in this direction, as none of these coins formed part of the collection of Mr. Masson, to the description of which the “*Ariana Antiqua*” was specifically devoted.

In the year 1848, I had occasion to advert incidentally to this series of Indian mintages, and on examination, detected the name of BUDHA GUPTA amid the imperfectly outlined letters of their le-

* J. A. S. B. III. Pl. XVIII. fig. 20, p. 230. Vol. IV. Pl. XLIX. figs. 10, 11, 12, p. 687.

gends.* In this state I allowed the enquiry to rest, until my attention was recalled to the subject by the discovery of a coin of a similar description in the ruins of the Sarnáth monastery by Professor Fitz E. Hall.† As in the progress of collecting, my own cabinet had by this time become enriched with new specimens of the type, and as I had the immediate advantage of access to Col. Stacy's ample collection, I was able by a careful collation of the isolated characters of the several varieties to identify the names and titles of three monarchs of the race of the Gupta Kings of Allahabad and Bhitári lât renown, whose gold currency is conspicuous in the various groups of the heretofore denominated "Canouj series."

* J. R. A. S. XII, 70, Pl. II. figs. 55, 57.

† But I have other obligations to acknowledge; to Mr. Hall I am indebted for explanations and assistance upon all doubtful or difficult interpretations of Sanscrit legends and inscriptions.

I myself pretend to the most limited knowledge of that language. I indeed, present the apparent paradox of being able to read and transcribe with precision, that which I only imperfectly understand, and it has happened thus; scholastic requirements taught me *Bengali*—intimate official intercourse, of five years' duration, with a people who wrote in *Hindi*, instructed me in all the modifications of that alphabet, from the polished penmanship of the bráhmaṇ and the current hand of the recorder of evidence, to the quaint contracts of village communities, and the crude writing of the ignorant, who, distrustful ever, would allow no foreign hand to tell their tale. The vehicle of expression varied almost in a like degree, from the glazed surface of the gold-spangled *Khurítah* to the petition of the northern Bho-tias on their time-honored Birch-bark!

Thus broken in, Prinsep's Ancient Alphabets came to me as an earlier style of English might have done—thereafter, I gathered, as I went, such information as was necessary for my passing purpose; but, as Indian Numismatics did not exclusively occupy my attention, I abstained from devoting my time to acquiring a language that seemed likely to be of no other use to me.

Thanks have I too—and many—to return for the kindly aid of one, an almost stranger to myself, but united in devotion to our common cause, that most promising young numismatist, G. H. Freeling, Esq. C. S.

Whatever of novelties his already rich cabinet could boast of either in this or in other departments, have always been freely and unreservedly placed at my disposal. To Major Bush (24 N. I.) likewise my cordial acknowledgments are due for the liberal manner in which he at all risks, has forwarded for my examination his entire Gupta and Saurashtran series!

Before proceeding to notice these new silver coins,* it occurs to me, that it may be useful to enter upon a descriptive synoptical view of the entire suite of the Gupta mintages, exhibiting the various published types in serial order, and introducing, as opportunity may offer, any novelties that have become known, since the last article on the subject appeared in this Journal.† Moreover some such systematic classification is clearly demanded in this place, as not only are all previous notices of these coins scattered in detached numbers of the Journal, or inserted in other independent works, but our latest contributions necessitate a modification of the serial arrangement of the coins themselves, as well as amended appropriations of some of their numbers to the separate monarchs of the line.

I fear that I must claim indulgent consideration for the many imperfections of this article, for not only was the greater part of it the result of an after-thought, but when that portion was already prepared, new coins continued to pour in upon me even to the last, so that alteration and amendment had to proceed *pari passu* with the influx of fresh materials, possibly to the serious damage of some sections previously written and forwarded to the printers: add to this, my own contemplated departure from this country has prevented either my recasting this descriptive catalogue, or bringing it to a satisfactory completion in its most important aspect—the due and full explanation of the recently deciphered legends, the first transcript of which time has barely admitted of my submitting to Professor Hall, without the possibility of any further discussion or renewed reference to originals in doubtful cases.

The recorded Gupta Kings number nine, succeeding in the following order :—

- | | |
|-------------------------|------------------------|
| I. Sri Gupta. | II. Ghatot Kacha |
| III. Chandra Gupta 1st. | IV. Samudra Gupta. |
| V. Chandra Gupta 2nd. | VI. Kumára Gupta. |
| VII. Skanda Gupta. | VIII. Mahendra Gupta?‡ |

and after an interval Budha Gupta.

* J. A. S. B. IV. Pls. XXXVIII. and XXXIX. Vol. V. Pls. XXXVI. and XXXVIII.

† J. A. S. B. V. 643, and VI. 319.

‡ My faith in the sufficiency of the identification of Mahendra Gupta as the

The data for this list will be found under the following references :
 I. *Allahabad lât*, second Inscription (J. A. S. B. iii. 257 and vi. 969.)* “II. Mills” *Bhitâri lât* Inscription (J. A. S. B. VI. 1;) III. 2nd Skanda Gupta Inscription *Kuhaon* pillar (J. A. S. B. VII. 37;) IV. The partially deciphered Skanda Gupta Inscription on the Rock at *Junagad* in Guzrat (J. A. S. B. VII. 348,) and new transcript of the same writing (Journal Bombay Branch Roy. As. Soc. April, 1842;) V. Chandra Gupta Inscription on the eastern gate of the Buddhist Tope at *Sanchi* near Bhilsa (J. A. S. B. VI. 455.) Udayagiri ditto “Bhilsa Topes” p. 151.† VI. Budha

successor of Skanda Gupta is based rather upon his coins, which seem naturally to follow suit, than upon the record on the *Bhitâri lât* regarding which, Professor Mill remarks as follows : “This worthy worshipper of SIVA and DUARGA [Skanda Gupta] ascends to heaven: and his brother and the other chiefs, with mingled feelings of grief and affectionate allegiance proclaim his young child the heir to his father’s crown and conquests. This youth is described as obedient to the Queen dowager his mother, as was Crishna to his mother Dêvakî; but the part of the inscription that proceeds to speak of him is confused and unintelligible; neither does he appear to be once named; unless we conceive some letters of line eighteen to give his name thus: MAHESA-PRITI-GUPTA, (*the Gupta attached to Siva or beloved by Siva.*) He is probably the Mahendra Gupta whose name occurs in several of the newly discovered coins of this dynasty.” (J. A. S. B. VI. 8.)

Major Cunningham suppresses MAHENDRA GUPTA altogether, though he does not assign his reasons for so doing, but in compensation he gives us two SKANDA GUPTAS, the second of whom he distinguishes by the title of *Lagraditya* or *Lokaditya*, making him succeed directly after the great SKANDA GUPTA for whom he reserves the title of *Kramaditya*! (Bhilsa Topes, 141.)

* Since the publication of my previous remarks on the *Daira putra Shahi* of the Allahabad column Inscription (No. V. p. 389) I have had an opportunity of examining that monument, and have satisfied myself that the correct reading is देव पुत्र पद्मि षष्ठान षष्ठि

† Major Cunningham, in his work on the Bhilsa Topes has given a facsimile as well as an English transcript and translation of this Inscription: the two latter are as follows :

“Siddham samvatsare 82 Sravana-mâsa suklekadasya ”

“Parama-Bhattâraka Mahârâjadhi CHANDRA GUPTA pādâ na dâ ta sya.”

“Mahârâja Chagaliga potrasya, Mahârâja VISHNU-DÂSA putrasya.”

Sanakânikâsya Mahâ (râja * * *)

“Finished in the year 82, on the 11th of the bright half of the month of Srâ-

Gupta Inscription on the Pillar at *Eran* near *Ságor* J. A. S. B. VII. 632.

I would premise, in introducing the following recapitulation, that I have indicated the doubtful readings of legends by the use of Roman type; where the transcript is given in Sanscrit letters, it is to be understood, that the decipherment is not contested. In the supplementary observations appended to each classified exemplar, the latter character is also employed, as being most readily identifiable with the indeterminate originals.

GHATOT KACHA

CLASS A.—J. A. S. B. V. XXXIV. 12. *Ariana Antiqua* XVIII. 14.*

Obverse. Full length figure of the King, clothed somewhat after

vana; [the cave] of him, bowing to the feet of the paramount, homage-receiving, Supreme Mahárāja CHANDRA GUPTA the grandson of Mahárāja CHAGALIGA, the son of Mahárāja VISHNU-DÁSA, Mahárāja (name obliterated of Sanakánika." p. 15."

As I do not place much faith in Major Cunningham's Sanscrit lore, I have submitted an independent transcript of his original Facsimile Pl. XXI. (Bhilsa Topes) to the scrutiny of Professor Hall, who has kindly favoured me with an amended translation.

The transcript finally adopted will be seen to vary but slightly, from the version in Roman type inserted above. The translation however differs very materially—at the same time I must freely admit the disadvantages I have laboured under in having to follow the Lithograph of a London Artist while Major Cunningham's transcript has been made, I presume, from the original record. Some slight liberties have also been taken by Mr. Hall in correcting, in the modern version, the errors of Sanscrit orthography to be detected in the ancient text.

सिद्धम् ॥ संवत्सरे ८२ आवण मासे शुक्लैकादश्यां परमभट्टारक महाराजधि
(राज) श्रीचन्द्रगुप्तदानुध्यातस्य महाराज खगलिग पौत्रस्य महाराज विष्णुदास-
पुत्रस्य सनकानौकस्य महाराज-

("May it be) auspicious! On the 11th day of the light fortnight, in the month of Srávana, in the year 82 of — the great King of Sana Kánika, son of the great King, Vishnu-dasa, (and) grandson of the great King, Chhagaliga, (who, viz. Chhagaliga was) son of the supreme monarch (and) paramount lord of great Kings The auspicious Chandra Gupta * *!"

* Coins known to the author, 1st, Tregear (No. 12, *above*,) 2nd, the late Lord Auckland, 3rd, British Museum, 4th, Col. Stacy, 5th, Major Bush.

the fashion of the Indo-Scythians, the right hand is extended towards a small Mithraic altar, the left clasps the symbol standard of the moon.*

LEGEND "Kama-naruttam-ja GHA (TOT) KACHA. Son of an excellent man resembling Kama, Ghatot Kacha. [Prinsep V. 645.]

Under the left arm { क
च

Reverse. Female figure erect, holding a flower in the right hand, and supporting a Cornucopia on the left arm. The latter is supposed to identify the figure with the Parvati of the ΑΡΔΟΚΡΟ. Reverse of No. 9, Pl. XXXVI. Vol. V. and No. 9, of XXXVIII. Vol. IV. Monogram Variant of 155. Ariana Antiqua.†

LEGEND—सर्वराजोच्छेत्त. The exterminator of all Rājās.

My collated decipherment of the obverse marginal legends gives the following result.

कमभिरुत्तमैर्जय कचोऽशुमवजित्य ?

Professor Hall suggests,

कर्मभिरुत्तमैर्जयति कचोऽशुमवजित्य ?

"Kacha, having overcome Ansu, reigns by virtue of excellent deeds."

* J. A. S. B. IV. 375. Harsha Inscription XVIII. "By whom was placed on the top of the house of SIVA, his own appropriate emblem, the golden figure of a full moon."

† The monogram in the three coins which have not been engraved in the Journal Asiatic Society Bengal, differs slightly from the form to be seen in fig. 12 above cited. Professor Wilson, in adverting to the general subject of Gupta monograms, offers the following observations.

"There is also another remarkable proof of the connexion [between the Gupta and the Mithraic series,] in the use of the same monogram that is found upon the coins of Soter, Megas, Kadphises and Kanerki. Agreeably to the purport which there seems reason to assign to these monograms, the recurrence of this emblem on all these coins should denote the place of their coinage; but, as above observed, we have no reason to place these princes on the west any more than we have to bring the Indo-Scythians far to the east of the Indus. It is therefore, perhaps, merely a proof of imitation, and has been introduced without any definite object. It is of use, however, in addition to other resemblances, as evidence that the coins of the Gupta princes succeeded immediately to those of the Mithraic princes." (A. A. 418.)

Ansu is probably *Asu* as there is no sign of the *Anuswára* on the coins.

There is a letter I have been unable to identify after the concluding न्य of the above transcript, which as far as mere forms go represents द्य or ह्य.

The name of Kacha in the field has a long ञ् over the upper consonant.

In the present state of the enquiry, I abstain from any comments on the import of this obverse legend, which promises, if correctly rendered, to throw much light on the Gupta epoch in demonstrating more palpably whom this race conquered and whom they succeeded.

In regard to the reverse device, I may remark that Professor Wilson does not appear to have concurred in Lassen's* interpretation of the term ΑΡΔΟΚΡΟ, as *Ardh-Ogro* half Siva, i. e. *Parvati*. He has not, however, directly contested the determination and under another form almost countenances such an association in speaking of the figure on the Kadphises coins as that of "Siva and his spouse in their composite character of *Arrdha-nárísvará*, Siva half-feminine."†

The exhibition of Parvati,‡ on their coins may be felt to be somewhat inconsistent with the Vaishnavitendencies of the early Guptas, and is still more opposed to any notion of the Buddhist faith, the author of the Bhilsa Topes would claim for them;§ but, as Professor Wilson has observed, the adoption of this device may well have been a mere act of "imitation of a foreign design" irrespective of any aim at demonstration of creed; I myself have for long past contended, that more weight ought to be allowed, in estimating the significance of *Reverse* types—to local usage, and that their appropriation was ruled rather by the division of the country to which they at times became special, than to any question of the faith of the adopting dynasty. Striking examples of the disregard of the typical significance of devices, conjoined with an equal respect for national conventionalities may be cited almost on the same ground,

* J. A. S. B. 1840, p. 455, A. A. 361, 366, &c.

† A. A. 351.

‡ Num. Chron. VI. 20 —J. A. S. B. 1845, p. 437.

§ Bhilsa Topes, p. 157.

in the Sassanian retention of the identical Siva and Nandi, reverse of Kadphises* and in later days of the Ghaznavi maintenance unchanged of the Recumbent Bull of the Hindus on the Moslem coinage of Láhore.†

The recognition of this APΔOKPO figure as one of the forms of Parvati is conclusively set at rest by her appearing elsewhere as Durga seated on the lion, as well as by the subsequent modifications introduced on the Gupta *reverse* devices, where her form appears in association with the Peacock‡ primarily sacred to herself “and by her presented to her son *Kumára*,” the Indian Mars,§ whose identity as that Hindu divinity is further manifested by the adoption of his second title of *Skanda* into the kingly nomenclature of the Guptas.||

It is necessary to advert for a moment to the variety in the types of the monograms on these coins. Those of Col. Stacy and Major Bush have the same symbol as the Ariana Antiqua piece, No. 14, Pl. XVIII. Prinsep's specimen, again, differs from these, in its two circular ornaments below the cross-bar, while its lower portion is

* Num. Chron. XV. 4.

† J. R. A. S. IX. 349.

‡ J. A. S. B. IV. Pl. XXXIX. figs. 28, 30. A. A. XVIII. 13.

§ Tod, I. 595.

|| Col. Tod in speaking of the various forms of Parvati adds the following comprehensive remarks on the subject :

“ This Isis of the Suevi * * the Búdha and Ella of the Rajpoots ; in short, *the earth*, the prolific mother, the Isis of Egypt, the Ceres of Greece, the Anna-purana (*giver of food*) of the Rajpoots * * * Gunga, *the river goddess*, like the Nile, is the type of fertility * * has her source amidst the higher peaks of the gigantic Himalya, where Párvati is represented as ornamenting the tiara of Iswara ‘ with a heaming moon.’

“ The mysteries of Osiris and those of Eleusis were of the same character, commemorative of the first germ of civilization, the culture of the *earth*, under a variety of names Ertha, Isis, Diana, Ceres, Ella. With the [Buddhists] the beneficent *Lacshmi*, *Srí*, or *Gauri*, is an object of sincere devotion * * such is the affinity between the mythology of India, Greece and Egypt, that a bare recapitulation of the numerous surnames of the Hindu goddess of abundance would lead us beyond reasonable limits ; all are forms of *Párvati*, or *Durgá Máta*, the Mater Montana of Greece and Rome, p. 574 to 576, Vol. I.”

completed by a perpendicular line. Mr. Freeling's coin further modifies the arrangement adopted in this last, by introducing a third circle in place of the vertical line. Simultaneously with these distinctions is to be noted the difference in the forms of that striking test letter म m. in the several legends ; on the first cited pieces it is shaped like the ordinary Gupta म of the Allahabad and other inscriptions, while on the latter it affects the form of the oldest type of the character, which retained its original identity in Western India to so much later a date.* The evidence of inscriptions seems to indicate that Bhilsa was one of the touching points of the two systems of writing at all events as regards this particular letter, as we find the Sanchi Inscriptions of Chandra Gupta† using the western character while other monuments of proximate locality employ modifications of the Gupta style of the letter.‡

The evidence of the inscriptions is also valuable in regard to the provincial forms of the र, a reference to which is necessary as justificatory of the reading of the suffix to that letter on the coins under consideration.

The western system of writing continued the vertical down stroke of the character by a backward turn, and the same practice is followed in finishing the perpendicular line of the क.§ The eastern Inscriptions, on the other hand, exhibit the र as a simple unswerving stroke from the mátrá ; and the vertical portion of the क is, in like manner, wanting in the foot curve.|| The two coins above noticed, which use the eastern form of क and म, give the र a curve similar to the western type of that letter in order to express र, and the coins which affect the western style of writing define the उ by a double curve in the opposite direction to that followed by the ordinary linear completion of the local form of the simple letter.

* Wathen's Plates, J. A. S. B. IV. 476.

† J. A. S. B. VI. 455.

‡ Eran Inscriptions, J. A. S. B. VII. 632 and 634.

§ Sáh Insn. VII. Pl. XV. Chandra Gupta *Bhilsa* VI —Pl. XXV. Udayagiri Bhilsa, Topes," Pl. XXI. Wathen, IV. Pl. XL.

|| Allahabad, Bhitari, Kuháon, Budha Gupta, Toramána.

CHANDRA GUPTA 1st.

CLASS A. 1. J. A. S. B. V. XXXVIII. 7, A. A. XVIII. 1.
No. 1, (Freeling) weight 121 grains.

Obverse. The King standing erect, his left hand rests upon his *Khanda*, or straight sword, while his right is advanced in the act of casting incense on the usual miniature Scythic altar. A *Chattah*, the Indian emblem of sovereignty, overshadows his head. The attendant introduced below his left arm grasps the staff of the umbrella.

LEGEND. व? क? मादित्य क्षितिमवजित्य श्वरः

Mr. Hall proposes to read

विक्रमादित्यः क्षितिमवजित्य समरे

Vikramāditya, having conquered the earth in battle."

Reverse. Female figure, similar to that in *Class A.* with the exception that the left hand holds the flower, while the right extends a regal fillet. Monogram No. 159, A. A.

LEGEND. विक्रमादित्यः *Vikramāditya*, No 2, wt. 121 gr.

VARIANT. A second coin, also in the possession of Mr. Freeling, contributes the concluding portion of the *obverse* legend inserted above.

The Reverse device, though identical in character with that of No. 1, offers a modification in the attitude of the figure, which is here exhibited in full front view, and draped with the transparent garments of MAO and others of the Kadphises group (J. A. S. B. IV. XXXVIII. 10.) Though otherwise it is far more *Indian* in its treatment than the copy from Greco-Scythic models to be found on the other coin. The monogram also differs from that in coin 1, and assimilates to those found on Ghatot Kacha pieces, (J. A. S. B. V. XXXIV. fig. 12.) except that it has the second cross-bar as in No. 160, A. A. The Vikramāditya has but one क instead of the double letter क्क in No. 1.

These coins are attributed by Major Cunningham to Chandra Gupta the IInd; but on typical grounds alone, they must clearly be assigned to the first prince of that name; and I further draw the

distinction in regard to the titles that the full *Vikramāditya* seems to belong to the third monarch of the family, while the *Sri Vikrama* remains special with the fifth of the race.

CLASS B.—J. A. S. V. XXXVI. 15, A. A. XVIII. 3, Marsden, No. MLVIII.

Obverse. Device. King leaning on his spear, facing him is a female figure.

LEGEND. Indeterminate, under the arm { च
न

Reverse. Parvati, with cornucopia, seated on a lion.

LEGEND. पञ्चवयः "The five excellencies."*

I assign these coins to Chandra Gupta the 1st, but with some hesitation, my chief ground for the attribution being the title on the reverse; there are, however, some minor typical indications that give strength to the attribution, especially the appearance on Mr. Masson's coin of the standard of the full-moon otherwise peculiar to Ghatot Kacha, or even supposing the staff, upon which the King's left hand rests, to be an ordinary spear or javelin, it is to be remembered that these weapons have definitively been superseded in this position, on the coins of Chandra Gupta the second of the name, by the bow, which he adopts from his predecessor Samudra Gupta. In Marsden's coin the family name of Gupta is inscribed in a line with the Chandra on the opposite side of the standard shaft, a practice which seems to have been discontinued after the introduction of the bow into the coinage devices by Samudra Gupta.

SAMUDRA GUPTA.

CLASS C.—J. A. S. B. IV. Pl. XXXVIII. figs. 16 and 17, Vol. V. Pl. XXXVI. fig. 14, A. A. XVIII. 6 and 9.

Obverse. The usual standing figure of the King; to the left of the field is seen the small altar of the Scythian prototype, associated

* Prinsep adds "to wit of a King. There is a fault in the orthography however * * The words should be written पञ्च वयः. Whether the word *chhavaya* "light" may have any allusion to the five luminaries of the Mithraic worship: the sun, the moon, fire, Jupiter and Venus, it is impossible to say: but that a King should possess five virtues, we learn from various Hindu authorities.

now, for the first time, with the Peacock Standard* (fashioned like

* Professor Wilson supposes this to be "a banner with a bird, probably Garuda, the winged vehicle of Vishnu, but as Skanda Gupta continues to use the emblem, its recognition as an exclusively Vaishnava symbol would create a difficulty in the way of any concurrence with the Rev. H. Mill's theory of the attachment of that prince to the 'opposite system' of worship—Saivism—(J. A. S. B. VI. 7,) but on the other hand, we are struck with the fact of Skanda Gupta retaining the name of *Bhāgavata* (Vishnu) on his silver coins. I think, however, that Prof. Wilson has, in another place, afforded a clue to the reconciliation of these apparent discrepancies, and that in speculating upon such sectarian divisions, we should more distinctly bear in mind that in the early development of Hinduism, there was but little of antagonism between the tenets of the two creeds; as it has been remarked in reference to the Agni Purana "being of the Vaishnava class: at the same time [that] it leans very favourably to the worship of *Siva*, as the *Linga*, and is full of *Tāntrika* ceremonies in honour of that form of the deity. It was compiled therefore probably anterior to any wide separation between the Saiva and Vaishnava sects." (J. A. S. B. I. 82.)

As regards the Bird symbol, I think the most obvious and natural interpretation is to look upon it as designed to represent the Peacock, which appears with such frequency on the gold coins and occupies the entire reverse field of one type of the silver coinage.

Major Cunningham—as I have before remarked—claims for Chandra Gupta the second and Kumāra Gupta a Buddhist belief, on the ground of their being designated in the Bhitāri Inscription as "worshippers of the SUPREME BHAGAVAT," which, title he proceeds to argue, must apply either to Vishnu or Buddha, and he concludes, "but as Bhagavat is one of the commonest of the many titles of Buddha, the balance of evidence still remains very much in favour of Chandra Gupta's attachment to Buddhism" (Bhilsa Topes, p. 157). The author however seems to have forgotten that he had previously observed in reference to the deities of each creed, that "the common Brahmanical term, however, is *Bhagavat* and I believe that the use of Bhagavān is almost peculiar to the Buddhists," (p. 105, see also J. A. S. B. VI. 872 and VII. 283). It is further to be remarked, apart from many other vital objections—that, if his deduction is to stand, it will be equally necessary to convert Skanda Gupta from Saivism to Buddhism, in virtue of this same term as found on his coins, classes *c. d. e. infra*! Neither am I disposed to attach any more value to his other argument to the same effect, founded on the Sanchi Inscription of Chandra Gupta IIInd, J. A. S. B. VI. 456, inasmuch as even admitting Major Cunningham's *improved* reading of the opening passage of the Bhilsa Topes, 151, the rest of Jas. Prinsep's translation, which is not objected to, does not very clearly show how much the grant for Buddhist purposes was the direct act of the master or servant! and the assumed amount of £25,000, upon which much stress

a Roman Eagle). The King's left hand rests upon a Javelin.*

LEGENDS 1. Sri ? (a) parajita davaja [Prinsep IV. 635].

2. Vijayajataka Samara satamataga (ja). [Prinsep V. 646]

Under the arm { स
सु
द्र

Reverse. Pārvati seated on a raised throne, with Cornucopia and regal fillet.

LEGEND—परक्रमः—‘The powerful.’

The first of these obverse legends was derived by Prinsep from Coin 16 above cited—the second transcript was obtained from No. 14, aided by other specimens. Professor Wilson [A. A. 424,] distrusts these readings, and apparently with good reason. The following gives the most exact detail of the isolated letters I have been able to compile from the specimens I have examined—

समरशतवत तवजय जतर

it is to be remarked however, that the 1st and 3rd of the three त's, at times show much more of the similitude of the ordinary letter न, but it will be remembered, that this is the correct type of the त in certain Western Alphabets.† Professor Wilson had suggested, (A. A. 424) doubtfully, the reading *Samara sata vataga* for fig. 9, but a coin of Col. Stacy's gives the *t* quite distinctly, where the Professor would read *g*.

is laid, dwindles down to a very unprincely donation under Jas. Prinsep's note of interrogation after the (thousands ?) [sic in orig.], the rejection of which reduces the total to £25 !

All the rest of the reasoning to this end depends upon Chandra Gupta's date, which Major Cunningham has certainly not yet succeeded in proving to rule from 400 A. D. to 430 ; but not only is this epochal determination based on the merest assumption, but up to this moment, there is nothing whatever to show, that the Chandra Gupta of the *Sanchi* and *Udayagiri* Inscriptions may not be the Sovereign *first* of that name in the Gupta family. The coins, we have some data for attributing to the several Chandra Guptas, but these inscriptions give us no aid towards any such identification ; not that I wish to contest the assignment, but it is fit that it should be known to be a clearly open question, and that all deductions based on the subordinate information, must be received with caution.

* The Javelin, the battle-axe and the arrow are enumerated among the weapons Samudra Gupta was in the habit of using as detailed in the Allahabad Inscription. See J. A. S. B. VI. 979.

† Dr. Stevenson, *Bombay Journal* (July 1853) pl. 17. Kistna, Canara, &c. J. A. S. B. VI. Pl. XIII.

Unpublished Variety of C. Weight 120 gr. *Major Bush.*

Obverse—device as in class C.

LEGEND—5 or 6 letters illegible त व त त व ज य जितरे प र ज त
द व ज one letter or more obliterated. On the sides of the Javelin

स ग
मु उ
द्र ञ

Reverse—as usual.

CLASS C. 1.—J. A. S. B. Vol. IV. Pl. XXXIX. fig. 19, A. A. XVIII. 7 and 8.

Obverse. The general outline of the device is the same as in Class C, except that the Peacock Standard is now adorned with Pennons—and a further modification occurs, in the substitution of a bow for the previously adopted javelin, while the arrow in the right hand of the King supersedes the Indo-Scythic Altar, which is henceforth altogether discarded.

LEGENDS are usually defective; Prof. Wilson detects the word *Vijaya* on the margin of No. 8, and there is a most tantalizingly long legend in continuation on coin 7—which it would be hazardous to attempt to read from any mere mechanical engraving.

Reverse—Parvati, as in class C.

LEGEND—अप्रतिरथः “The invincible in his War-Chariot.”

This term is applied to Samudra in the Allahabad lát Inscription—एथिव्यामप्रतिरथस्य “whom in his war-chariot none in the world can rival or withstand.” (J. A. S. B. VI. 975).

Professor Wilson renders *Apratiratha* as the ‘unsurpassed warrior,’ “a genuine Sanskrit title.” (A. A. 420, 424).

CLASS C. 2.—J. A. S. B. IV. Pl. XXXIX. 23, Vol. V. XXXVI. II. A. A. XVIII. 10.

Obverse. Figure of the King, in a slightly varied attitude, the right hand rests on the hip-joint, the left is placed on the head of the Battle-axe—to the front of the monarch is a standard surmounted by the device of a new moon below or beyond which, is the figure of a youth.* (The A. A. coin reverses the position of the two figures.)

* “Of him [Samudra Gupta], when the accepted son was pronounced to be the son of Dévi, daughter of Mahadaitya.” Bhitári Lát, J. A. S. B. VI. 6.

LEGEND. Kubháva paraguja, (Prinsep V. 645.)

Under the arm— $\left\{ \begin{array}{l} \text{स} \\ \text{नु} \\ \text{द्वे} \end{array} \right.$

Reverse. The ordinary Parvati figure—but her feet rest on either “seeming flame” according to the A. A. Coin; or “the leaves of the lotus,” in the Prinsep specimens.

LEGEND, **वृत्तान्त परशु** The battle-axe of Pluto.

Prof. Wilson in speaking of Prinsep’s decipherment of these legends, remarks “his attempts to give a meaning to these syllables are very unsuccessful,” he himself suggests *Kratu-paraga* (A. A. p. 324, 325).

This legend, therefore, has hitherto presented an acknowledged difficulty; however, the individual letters appear in their well-formed outlines to be readily susceptible of definite identification. The legend obtained from several specimens and determined by Major Bush’s coin, is **वृत्तान्त परशु राजाधिराज**. “Sovereign of Kings whose battle-axe is like Pluto’s.”

A second coin in the Prinsep Cabinet, now in the British Museum, confirms this reading—with the important modification, that the second perpendicular line of the final consonant **श**, in Parasu, is prolonged downwards and forms thus *the* alternative subjunctive vowel **उ**, which letter the continuous curved up-stroke of the same limb of the **श** in coin 23, equally serves to represent. In this new coin the letter **र** intervenes between the **प** and the succeeding **श**, forming the word *Rāja*, possibly used as the opening of *Rājadhira*. In regard to the *s* which I read in preference to Prinsep’s *g*,* a moment’s examination of coin 11. Pl. XXXVI. Vol. V. will satisfy the reader that if the second letter in the reverse legend is an admitted *g*, the final consonant of the same word should accord with it in form, if the latter is to be received as an identical letter—it will be seen that it does not do so—but, as more distinct evidence of my assertion may be needed, I am in a position to add that the unpublished coin above alluded to, gives in the reverse final the **श** in all the distinct identity of the cross-stroke within

* J. R. A. S. XII. 75.

the double lines of the old g, which constitutes *the* essential distinction between the two letters.

CLASS D.—J. A. S. B. IV. Pl. XXXIX. fig. 26.

Obverse. The King is seated on a species of couch, or chair, the back of which is placed on the right hand side of the figure, in which arrangement it assimilates with certain forms of the throne of Párvatí. The Monarch is engaged in playing on the *Vina*, or Indian Lyre.*

LEGEND. महाराजाधिराज श्री स [मु] द्र गुप्तः

Reverse. Párvatí, with cornucopia and regal fillet, seated on an Indian *Morha*.

LEGEND. समुद्र गुप्तः

Class E.—J. A. S. B. IV. XXXIX. 31. 32. A. A. XVIII. 2. Freeling, W. 115 gr.

Obverse. A richly bedecked horse standing before an Altar.

LEGEND न व ज म धः राजधिराज पृथिवी विजयत्य ए; below the horse से.

Reverse. Female holding a *Chaori*, the figure is draped in the light garments of the Chandra Gupta 1st style (class A).

Legend अश्वमेध पराक्रमः The Hero of the Aswamedha.†

I have but little hesitation in attributing this coin definitively to Samudra Gupta.

The *Parakrama* title on the *reverse* would in itself go far to justify such an assignment, but the *obverse* title of *Prithivi Vijayaty* distinctly associates the identity of the monarch with Samudra, who has applied to him a similar style of eulogy in the Allahabad Pillar Inscription, where we read, श्री समुद्र गुप्तस्य सर्वपृथिवी विजयनितोदय &c.‡

* Samudra's "accomplishments in singing and playing" are eulogised in the 24th verse of the Allahabad Inscription. J. A. S. B. VI. 980.

† Wilson observes in regard to this type of coin, "That the steed represents one dedicated to the Aswamedha, or solemn sacrifice of a horse performed only by paramount sovereigns cannot be doubted, from the inscription Aswamedha-parakrama, he who has the power of the Aswamedha rites (A. A. 421.)" See also Tod, I. 63, 76, 583, &c.

‡ J. A. S. B. VI. 978.

A second specimen of this type of coin in the collection of Major Bush appears to vary the obverse legend—but the letters are too much worn to be satisfactorily deciphered.

CHANDRA GUPTA IIInd.

Class C. 1.—J. A. S. B. IV. XXXIX. 18. Vol. V. XXXVI. 13. XXXVIII. 9. A. A. XVIII. 4. Marsden No. ML.

Obverse. Figure as above C. 2.

LEGENDS, imperfect. The following is a restored reading obtained from Col. Stacy's coins.

देव श्री महाराजाधिराज श्री चन्द्रगुप्त. His Majesty.

Under the arm { च } "The auspicious sovereign of great
 { न्द्र } Kings, Chandra Gupta."

Reverse. Parvati seated on an elevated throne with cornucopia and regal fillet (in No. 18). The cornucopia is replaced by a flower in the later specimens.

LEGEND. श्रीविक्रमः "The illustrious hero." (A. A. 420.)

Variant No. 1, No. MLVII. Marsden.

The obverse device presents a modification in the arrangement of the Bow, which is turned inwards and touches the side of the figure—while the चन्द्र is inscribed in the field outside of the bow-string. Legend, to the left, श्रीचन्द्रगुप्त.

Among a batch of twenty gold coins found at Gopálpur on the "Gogra river, on the site of the old Village Fort, ten miles west of Burhul," in July 1854,* I observe a coin which corresponds very closely with this variant, and confirms in the most definite manner the reading of the right marginal legend already assigned to the original type C. 2—every letter is here indubitably to the following effect.

देव श्रीमहाराजाधिराज

Class F.—J. A. S. B. V. XXXVIII. 6.

Obverse. King on horseback proceeding to the right, with lance at the charge.

* Seven of those coins were submitted to the Government N. W. P. in May last, by Mr. W. Roberts, the officiating Judge of Goruckpore—all these are from the mints of Chandra Gupta 2nd.

LEGEND. परम भ* श्रीचन्द्रगुप्तः

Reverse. Parvati seated on an Indian *Morha*, with fillet and flower.

LEGEND. अजित विक्रम

KUMARA GUPTA.

Class C. 1.—Freeling (unpublished.)†

Obverse. Device as is usual in this type.

LEGEND on the margin * महाराजधिराज **

Below the arm { के
म
र

Reverse. Parvati seated cross-legged on a lotus, the right hand holds a fillet, or at times, a flower—the left rests either upon the knee or on the side of the figure.

LEGEND श्रीमहेन्द्र Śrī Mahendra.

Variety No. 1. J. A. S. B. V. XXXVI. 16. A. A. XVIII. 11. the name of the King is given, in this coin, as above, but it is placed in a line with the bow-string *outside* the arm of the figure as in variant No. 1, C. 2, of Chandra Gupta IIInd.

Variety No. 2. J. A. S. B. V. XXXVI. 20. A. A. XVIII. 12.

Obverse. Device as usual.

LEGEND * जयति महेन्द्र * * under the arm कु.

Variety No. 3. An unpublished coin in the Prinsep Collection B. M.

Obverse. General device as in No. 2.

LEGEND on the margin: this I am unable, at this moment, to transcribe, but it concludes with the name of Kumāra.

Reverse. Device as above.

LEGEND. श्रीकुमार गुप्त.

Variety No. 4. Freeling. W. 125 gr.

Obverse. Device as in No. 2.

LEGEND * * * व—विजितावनिरवनिपति. See silver coins *infra*, class 1 2 3 &c.

* परम भागवतो is one of the Prefixes to Chandra Gupta's name in the Bhitāri Lāt Inscription, J. A. S. B. VI. 4.

† This coin, though a cast, appears to have been taken from genuine original.

Variety No. 4. Col. Stacy. Wt. 126 gr.

(*Obverse*. Device as usual. The name of कुमारगुप्त occupies the left margin. There is no name or initial under the arm.

Class G. Type. J. A. S. B. V. XXXVIII. 1.

(Unpublished coin of Col. Stacy's Cabinet.)*

Obverse. King facing to the right, armed with a bow, shooting a lion.

LEGEND. संहविक्रमकुमार [गुप्तपरिधि] संह महेन्द्र

Kumara Gupta, of might like a lion's most prosperous [Mr. Hall.]

Reverse. Parvati seated on a lion, her right hand extends the fillet, the left, which rests upon her knee, holds a flower.

LEGEND. संहमहेन्द्र —Sinhá Mahendra.

Variety No. 1. J. A. S. V. XXXVIII. 8.

Obverse. LEGEND * न महेन्द्र जय * * श्री * *

Reverse. LEGEND महेन्द्र सिंह

Class H. 1. J. A. S. B. IV. Pl. XXXIX. fig. 25.

Obverse. The King facing to the left, armed with bow and arrow, attacking a lion.

LEGEND. महाराजाधिराज श्री * * *

Reverse. Parvati with fillet and flower—seated on a lion.

LEGEND श्रीसंहविक्रमः Srí Sinha Vikramah.

Class G. 2. J. A. S. B. V. XXXVIII. 1, 2.

Obverse, as above, class G.

LEGEND—?

Reverse, as above, class G.

LEGEND. सिंहविक्रमः

Class I. J. A. S. B. IV. XXXIX. 28.

Obverse. Erect figure of the King, who has just discharged his arrow at a lion.

LEGEND "Sri bal parakrama" [Prinsep IV. 637.]

Reverse. Standing female, with flower in the left hand, the right is extended to a Peacock.

LEGEND. कुमारगुप्त * * * Kumára Gupta * *

* This coin—in weight 126 grains—is also a *cast* from a genuine original.

SKANDA GUPTA.

Class C. 1.—J. A. S. B. IV. XXXIX. 22. Vol. V. XXXVI. 17, 18. XXXVIII. 10? Marsden MLV.

Obverse, as in class, C. 2.

LEGENDS imperfect—under the arm { स्क
न्द

Reverse. Parvati seated cross-legged on lotus flowers.

LEGENDS on 22 and 17, क्रमादित्यः Kramādityah.

Ditto on 10 and 18, श्रीस्कन्दगुप्तः Śrī Skanda Gupta.

Class J. J. A. S. B. IV. XXXIX. 24.

Obverse. King to the left of the field, holding a bow—the Peacock standard occupies the centre and a female figure fills up the space on the right.

LEGEND, illegible.

Reverse. Parvati on lotus, with flower and fillet.

LEGEND. श्रीस्कन्दगुप्त—Śrī Skanda Gupta.

MAHENDRA GUPTA.

Class Jf. 2. J. A. S. B. IV. Pl. XXXIX. 30, Marsden MLIX.

Obverse.—Horsemen as in class F, but without the lance.

LEGEND * * महेन्द्र गुप्त.

Reverse.—Female seated on a morha, feeding a peacock.

LEGEND.—अजित महेन्द्र—Ajita Mahendra.

Variants. J. A. S. B. XXXVIII. figs. 3, 4, 5, A. A. XVIII. 16, 70.

Class F. 3. Unpublished. Freeling.

Obverse.—Device as is usual in this class, with the exception that the horseman is proceeding to the left instead of to the right.

LEGENDS undeciphered.

Reverse.—Parvati with peacock.

LEGEND—अजित महेन्द्र.

There is a gold coin in the Prinsep collection B. M. very similar to the type of class C. which has the following letters thus arranged under the left arm पु म The Reverse displays the usual

हे

figure of Parvati with the remains of a *Greek* legend.

I next proceed with the various series of *silver* money of the Gupta princes.

SRI GUPTA?

CLASS *a*; Silver, weight 31 grains. Freeling, unique and unpublished.

Obverse.—Device, the original type of the Sáh head, apparently unchanged in outline or details.

LEGEND, as usual, in imperfect Greek characters, the concluding six letters of which alone are visible, thus—ACIOIO.

Reverse.—Device, a singular figure that may possibly represent the early design of the Gupta peacock as rendered by the local artists, beneath which is a linear scroll of three semi-circles similar to that seen in continued use on certain silver coins of Skanda Gupta,* above the main device are retained the *Sáh* cluster of stars and a minute half moon seemingly borrowed from the same source.

LEGEND—श्री — न्दगुप्तवक्त्रमद्रस्य श्रीगुप्तकीलालेन्द्र. — — —

Prof. Hall proposes to amend the legend, thus—

श्रीनन्दगुप्तविक्रमेन्द्रस्य श्रीगुप्तकीलालेन्द्र — — —

To this he assigns the following translation: "The auspicious, KÍLÁLENDRA, son of the auspicious NANDA GUPTA, (who was) an Indra in prowess." Thus reading the SRI GUPTA as the mere title; I should prefer to consider it as the regal designation, accepting KÍLÁLENDRA as the personal name, the use of which may well have been discontinued in the subsequent family inscriptions. The name of Srí Gupta's father is of but little import, we may, therefore, for the present let it stand as Nánda.

There is probably no coin in the entire Gupta series, of which we are at present cognizant, that possesses so much historical importance as this diminutive piece.

The absolute identity of the execution of the obverse device with that of the fixed Sáh model necessitates a concession of an almost immediate succession of some portion of the Gupta family to the

* J. A. S. B. IV. Pl. XLIX. figs. 4, 5, VII. Pl. XII. fig. 19; J. R. A. S. XII. Pl. II. figs. 43, 44; A. A. XV. 20. Prof. Wilson in speaking of the reverse device of this particular coin describes it as "an ornament like a disintegrated Chaitya."

dominions of the Śáh kings of Suráshtra. I had formerly, while reasoning upon the numismatic materials then at command, been led to conclude that a considerable interval might have elapsed between the fabrication of the Śáh exemplars and the deteriorated Gupta imitation of that style of coinage, but I am now fully prepared to amend this inference, and to approximate the later Śáh monarchs very closely to some of the early members of the Gupta race; to carry this out satisfactorily I am aware that I must either modernise the Śáhs from my first assignment of date or elevate ten Guptas to a higher degree of antiquity than I have previously claimed for them.*

It is not my intention, neither have I time at command while this paper is being put to press, to enter into the general re-consideration of the true Śáh epoch, it is sufficient for the present to indicate freely the new bearing assumed of the entire question under the evidence, contributed by the type of this unique coin.

KUMÁRA GUPTA.

CLASS *b*; J. A. S. B. VII. Pl. XII. 16, 17; J. R. A. S. XII. Pl. II. 39, 40, 41, 42; A. A. XV. 17, 18.

Obverse.—Head of the king in profile: the outline and design are nearly identical with the Suráshtran prototype, the mintage of the Śáh kings—at the back of the head is ordinarily to be seen a mutilated portion of the Scythian title PAO NANO. This important legend affords another link in the direct association of the Guptas with the Indo-Scythians, which is here the more marked, in that, while the device itself is servilely copied from the Śáhs, their obverse Greek legends are superseded by this new title.

Reverse.—It is difficult to determine satisfactorily what the emblem occupying the *Reverse* field may be intended to typify, but the most plausible supposition seems to be that it displays an advance upon the conventional representation of the peacock under

* I have had so much to object to in Major Cunningham's arguments and inferences, that I may here complementarily mention that, he has already contended for a direct and immediate succession of the Śáhs by the Guptas, *Bhil. Topes*, p. 148.

Western treatment, following out the artistic notion of that bird given in Srí Gupta's coin.

LEGEND.—परम भगवत राजाधिराज श्रीकुमार गुप्त महेंद्रस्य.

Parama Bhagavata Rájádhirája Srí Kumára Gupta Mahendrasya.

The second word of this legend is the only portion of the whole that is at all open to question ; it has been read *Bhánuvira* by Prinsep,* but this is not by any means a satisfactory interpretation. The 1st and 3rd letters are fixed and constant in the various examples, and are properly rendered in each case as भ and व ; the second and fourth letters vary considerably in outline on the different specimens ; the second letter I have never yet met with in its perfect shape as ग when tried by the test of the ग in Gupta, indeed the majority of the coins display it more after the form of a न, as that consonant is found later in the legend in Mahendrasya. The same remark also applies to the final त. I see that Prof. Mill has conjecturally supplied the word *Bhagavata* in the prefix to Kumára Gupta's titles on the Bhitari lát (VI. 4) but Prinsep's Facsimile of the inscription though it accords the needful space for the exact number of letters, gives the final as a manifest न ; in saying this, however, I must remind my readers that in the alphabet in question, the slightest possible inflection and continuation of a line constitutes the essential difference between the two letters न and त, and on the other hand the local copper plates of the Valabhis render the ग very much after the shape of the Eastern त, while the indigenous त is but little different from the न of the coins under reference. And finally as the words *Parama Bhagavata* appear in all their indubitable majority on the succeeding coins of Skanda Gupta, we may fairly assume a mere imperfection in the expression of the individual letters and leave the word as it has been entered in the legend above.

The coins under notice are not always complete in the Sanskrit legends ; for instance, an otherwise very perfect piece in the cabinet

* J. A. S. B. VII. 356. Prof. Wilson A. A. 412, has suggested *Bhattaraka* (?) which the Udayagiri inscription (Bhilsa Topes, 151) rather recommends to our notice.

of the Royal Asiatic Society has the word राजाधिराज abbreviated into राजाध; and No. 39 has the same word contracted to राजाधिर.

Since my last notice of these coins in the J. R. A. S. in April, 1848, I have had an opportunity of examining a set of very perfect coins, thirteen in number, which were found at Ellichpore in 1851, and presented to the late Sir H. M. Elliot. These do not however, add any thing to our previous knowledge of the subject. Their average weight was 29 grains, the highest being 32 grains.

SKANDA GUPTA.

CLASS *c*; J. A. S. B. VII. Pl. XII. 18, 19; J. R. A. S. XII. Pl. II. 43, 44; A. A. XV. 20.

Obverse, as in class *b*. Kumára Gupta, but the execution has greatly deteriorated; on some specimens traces of the word NANO are still to be seen.

Reverse.—The device in this class of money, appears to offer a more direct imitation of that of the Sri Gupta pieces, than did the intermediate Kumára reverse types, these latter are seen to reject the foot scrolls and to vary the details of the centre figure to a considerable extent.

LEGEND—पमर भगवत श्री स्कन्द गुप्त क्रमादित्य

Parama Bhagavata Sri Skanda Gupta Kramáditya.

PRINSEP, in his collated reading of the legends on these coins (J. A. S. B., vii. 356), adopted the letter म (for महा) as occurring after the word भगवत [or भगदत as he made it], which he found to be followed by the title of राज, which precedes the name of the monarch. This rendering, he would seem to have drawn from fig. 29, Pl. II., STEUART (J. R. A. S., 1837); but as the like letters do not generally recur, I have marked this as the exception rather than the rule.

The weights of these coins vary from 23 to 29 grains.

CLASS *d*; J. R. A. S. XII. Pl. II. 45, 46; A. A. XV. 19.

Obverse.—Crudely outlined head, with traces of the title NANO in front of the profile.

Reverse.—Figure of Nandí identical in form and position with the seal symbol of the Valabhi family as found on their copper-plate grants. (J. A. S. B. IV. Pl. XL. and p. 487).

LEGEND—[restored].

परम भगवत श्री स्कन्द गुप्त क्रमादित्य

Parama Bhagavata Sri Skanda Gupta Kramaditya.

These legends are frequently very incomplete, varying in the number of letters in each; but, as I have already sufficiently adverted to this subject,* I need not repeat my observations in this place.

The standard of these coins is very uncertain, rising from a weight of 21 to 30 grains.

CLASSES *e. f. g.* [The references are prefixed to each variety].

Obverse.—The usual head, generally ill defined, but still identical in many respects with the original device on the obverse of the Sáh medals; it is occasionally also accompanied by distinct traces of the word NANO.

Reverse.—Central symbol in the form of an altar, which is supposed to represent the common altar-shaped receptacle of the sacred Tulsí tree of the Hindus. Legends restored—

CLASS *e.*; J. R. A. S. XII. Pl. II. 49.

परम भगवत श्री स्कन्द गुप्त क्रमादित्य

Parama Bhagavata Sri Skanda Gupta Kramaditya.

CLASS *f.*; J. R. A. S. XII. Pl. II. 50.

परम भगवत श्री स्कन्द गुप्त परमादित्य

Parama Bhagavata Sri Skanda Gupta Paramaditya.

CLASS *g.*; J. R. A. S. XII. Pl. II. 51.

परम भगवत श्री विक्रमादित्य स्कन्द गुप्त

Parama Bhagavata Sri Vikramaditya Skanda Gupta.

“There are between seventy and eighty specimens of these various Tulsí device Skanda Gupta coins in the Prinsep collection, B. M. They are commonly but carelessly fashioned, and unevenly struck. The letters of the legends, however, are in high relief, and unusually well preserved, though there is at the same time a decided absence of uniformity in the expression of many characters of analogous value, and their general outline is remarkable for a degree of rude-

* J. R. A. S. XII. p. 66; J. A. S. B. ? ?

ness, similar to that already noticed by Prinsep* as existing in the coeval alphabet of the 3rd or Skanda Gupta Inscription on the Girnar Rock.

The irregularity in the completion of the legend noted as occurring on Skanda Gupta's coins with the Bull reverse, appears in a still greater degree in those of the present class.

The weight of this class of coins is more than ordinarily unequal, rising from $22\frac{1}{2}$ to 33 grains!

Though not properly susceptible of classification with any Gupta series of coins, it is needful to notice in connexion therewith a species of money which seems to constitute an independent derivative from the same Saurastrian type that served as a model for the local currency of the Guptas in certain Western provinces of their empire.

I allude to the pieces figured as Nos. 6 to 8 and 9, Plate XLIX. Vol. IV. J. A. S. B.† Prinsep at the moment of their publication‡ scarcely attempted any decipherment of the certainly very unpromising legends, and was equally at fault in regard to the reverse device which he described as "a symbol in the form of a trident:"§ when subsequently he came to take up the general subject of the Sáh and Gupta silver coinage in full detail,|| he still essayed no advance upon the attribution of this offshoot of their common prototype. In my paper on the Sáh kings¶ I made some slight progress towards determination of the purport of the legends, and apart from the typical coincidences, was able to demonstrate more precisely the Sáh association in the decipherment of the words राज्ञो महा क्षत्रपस on the margin of the best preserved specimen of the series.

* J. A. S. B. VII. 348.

† Other examples of this currency will be found delineated in J. R. A. S. IV. Pl. II. fig. 30, XII. Pl. II. figs. 35 to 38.

‡ December, 1835.

§ Prinsep writes "figs. 6 to 9 are one step further removed from perfection. The legend where best preserved, as in fig. 9, appears a mere repetition of the letter *p*, with the suffix *r*, *ri*, and *y*, * * * the central symbol has the form of a trident. Lieut. Burnes informs me that several hundreds of these three species of coins were found in Cutch in 1830, in a copper vessel buried in the ruins of *Puragarh*, twenty miles west of Bhoj, a place of great antiquity, and yet marked by the ruins of a palace and a mint." IV. 687.

|| J. A. S. B. VII. April, 1838.

¶ J. R. A. S. XII. 15th April, 1848.

A coin of Mr. Freeling's that I have now before me, of apparently early date presenting a well defined and nearly complete legend, promises materially to advance the enquiry and to furnish a key to the strangely distorted letters stamped on the later emanations from the parent mint. I proceed to describe the piece in the ordinary form.

Silver, weight 27 grains.

Obverse.—The usual Sáh head, apparently but little modified. This surface of the coin is damaged, but fully one-half the marginal space, around the profile, remains uninjured and in the total absence of any sign of a letter confirms my previous supposition,* that the use of the Greek legend was not extended to this class of coin.

Reverse.—Device, a barbarized imitation of the Minerva Promachos of the Bactrian Coinage.

I was once disposed to look upon the singular figure on the reverse of those coins as the Buddhist device of a man; I was led to this conclusion by the similarity of the form of the figure sketched by Jas. Prinsep, in fig. 21, Pl. XVIII. Vol. III. J. A. S. B. to that occurring on the Behat type of coins;† but I now observe that Prinsep, in his second engraving of the same coin IV. Pl. XLIX. 9, omits the left arm, in its downward position, which constituted the most essential point of Behat identity.

LEGEND. ग्रह भुनहरकसरञ्ज महद्वत्रपरमदवककृमसदमन

Variants ? श्रीः स ट

ह कृ

Prof. Hall, confesses himself fairly baffled by this legend: I therefore allow it to stand as originally transcribed from the coin, trusting that new specimens may hereafter aid in the due interpretation. The configuration of certain letters in these legends however demands a passing notice. The character which Prinsep took for *Pr.* &c., is now satisfactorily proved to be a म; the form is peculiar, but still it bears sufficient affinity to the general idea of the Gupta म. In the later specimens of the coinage, its upper section

* "One item seems safely deducible from the unoccupied margin, to be found around the bust in the broader coins, viz., that the use of Greek or its attempted representation was here discontinued." J. R. A. S. XII 63.

† J. A. S. B. IV. Pl. XXXIV. 16, Pl. XXXV. figs. 45-47, &c.

is distinguished from the ordinary ण by the rounding off of the lower portion of the first down-stroke, while the ण itself is squared at the base. The nearest approach to identity with this Numismatic न is to be found in the outline of that character as expressed on the Udayagiri Inscription, but it must be remarked that this similitude affords but little aid towards determining geographical limitation, as the majority of the letters of the inscription itself are exceptional, and do not accord with the characters of the other writings of the same locality. The न of these coins takes the same shape as those on Kumára's silver coins, Class *b*, above adverted to. The remaining letters, as far as they have been definitively identified, seem to follow the ordinary Sáh style.

My readers may consider these details tedious: they are necessarily so, but to justify myself for inflicting them, I may mention that while I am disposed to demur to Prinsep's conclusion, that the date of all Indian writings may be invariably determined by the mere forms of their letters, I am on the other hand inclined to believe, that under a comprehensive and well considered system of comparison of alphabetical characters, traced down from their common origin through existing monuments,* to the fixed modern forms, we may determine with some precision the section of the country, if not the kingdom,† to which any given inscription may owe its origin.

* The Bhilsa monumental writings in their variety might be supposed to militate against any such possible system of identification, but as has been before remarked, this sacred site seems to have been held in equal honor by eastern and western races, who possibly employed the indigenous artists to copy the originals peculiar to their several countries; if they did not even employ engravers from their own land.

† In seeking to discover the locality whence these coins emanated, it may be useful to note the information contributed by Hweun Thsang on the subject of the divisions of the western kingdoms: it is to be remembered, that though the supremacy may have varied, the classification of states probably followed the ancient boundaries.

Leaving Maháráchtra, Hweun Thsang is described as “se dirigeant au nord-est, il fit environ mille li, passa la riviere *Nāi-mo-t'o* (la Narmadâ) et arriva au royaume de *Po-lou kie-tchen-p'o* (Baroukatch' éva—Baroche) De lá, marchant encore au nord-ouest, il fit deux mille li et arriva au royaume de *Mo-la-p'o* (Malava) * *

I now approach the original object of the present paper, viz. the peacock reverse coins which form the appropriate conclusion of the Gupta series, in the double aspect of commencing with the designation of the VIth Monarch of the succession, and in presenting us with the sole medallion record of the latest king named in the inscriptions.

BUDHA GUPTA.

CLASSES 1, 2 and 3.

Obverse.—The usual head in profile, manifestly imitated from the normal Saurashtran device; the close fitting cap or helmet of the proto-type is however at times degraded into a mere skull-cap, the long hair is arranged after the manner of the Sâh model and the collar of the dress is likewise retained in its original identity. The general inferiority of the die-execution is most marked, and the Indian leaning of the artist is exemplified in the expression given to the eye, which instead of its once classic form is here exhibited in the almond-shaped, full-front optic placed well over the side of the cheek: in the marginal space outside the profile, are to be seen three letters or figures, which may be appropriately reserved for future

Suivant la tradition, le trône était occupé, il y a soixante ans, par un roi nommé *kiaï-ji* (çilâditya,) * * pendant les cinquante ans qu'il resta sur le trône. * * De là il fit de deux mille quatre cents à deux mille cinq cents li au nord ouest, et arriva au royaume de *O-tch'a-li* (Atali ?) * * De là il fit encore trois cents li au nord ouest, et arriva au royaume de *Kitch'a* (Kīṭa). [Ce pays est soumis au royaume de Ma-la-p'o. Si-yu-ki XI. 16.] De là il fit mille li au nord et arriva au royaume de *Fa-la-pi* (Valla bhi.)

“Le roi actuel est de la race des *Tsa-ti-li* (Kchatriyas); il est le gendre de *Chilo-'o-tie-to* (Cilâditya) roi de *Kie-jo-kio-che* (Kanyâ koubdja); son nom est *Toulou-p'o-po-t'o* (Dhrouvapaṭou). * * De là il fit sept cents li au nord-ouest et arriva au royaume de *'O-nan-t'o-pou-lo* (Anandapoura). De là il fit cinq cents li au nord-ouest et arriva au royaume de *Sou-la-tch'a* (Sourâchṭra) [Il est soumis au royaume de Falâpi Siyuki X. 18]. De là il fit dix-huit cent li au nord-est et arriva au royaume de *Kiu-tche-lo* (Gourdjara). [Ce roi est de la race des Kchatriyas *Siyu ki*, XI, 18]. Ensuite, il fit deux mille huit cents li au sud-est et arriva au royaume de *Ou-che-yen-na* (Oudjayana). [Le roi est de la race des Brâhmanes; *Siyu ki*, XI. 18].

De là il fit neuf cents li au nord-est et arriva au royaume de *Mo-hi-chi-fa-lo-pou lo* (Mahêçvarapoura). [Le roi descend d'une famille de brâhmanes]. De là, tournant à l'ouest, il revint au royaume de *Sou-la-tch'a*.”

examination in conjunction with the Indian Numerical series at large to which their various examples contribute an independent section.

Reverse.—Device, a full front view of a peacock with expanded tail.

LEGENDS.

CLASS 1. *Kumára Gupta*, J. A. S. B. IV. Pl. XLIX. figs. 10, 11 and 12.

देवं जयति विजितावनिरवनिपति कुमार गुप्तो

Dev(o) jayati vijitávanir avanipati(h) Kumára Gupto "His Majesty KUMÁRA GUPTA, who has subdued the earth, rules."

CLASS 2. *Skanda Gupta*, J. R. A. S. XII. Pl. II. figs. 52, 53.*

विजितावनिरवनिपति जयति देव स्कन्द गुप्त य

Vijitávanir avanipati(r) jayati deva(h) Skanda Gupta-y.

CLASS 3. *Budha Gupta*, J. R. A. S. XII. Pl. II. figs. 55, 57.

देव जयति विजितावनिरवनिपति श्री बुध गुप्त

Dev(o) jayati vijitávanir avanipati(h) Srí Budha Gupto.

When once fairly deciphered, these legends will be seen to present but few difficulties. The lapidary inscriptions have already proved that the Gupta artists indulged in faulty Sanskrit orthography as well as in grammatical errors, so I need not detain my readers by any comments upon minor imperfections, while the general sense of the legend is sufficiently clear. I must mention that in my devanágari transcripts, I have adhered servilely to original legends impressed upon the coins; the version in the Roman type is corrected up to Sanskrit requirements.

There is a superfluous य (or possibly a म after the गुप्त on Skanda Gupta's coins, the use of which is not apparent, but which clearly takes the place of the final O in Kumára's legends.

I may note that Kumára Gupta's coins display both the old form of म and the more specially Gupta outline of that character.† The य is also seen in its transition state from the triple lined letter of

* I should mention that my references to the published engravings of the coins of Skanda Gupta and Budha Gupta are based on my own facsimiles copied from the coins themselves.

† J. A. S. B. IV. Pl. XLIX. figs. 10 and 12.

early days to the almost modern form, while at times it appears on Skanda's money as a character not easily distinguishable from the later Kumára M, just adverted to. This extensive modification of the ँ in the numismatic alphabet is the more curious, as the corresponding lapidary character retains all the essentials of its ancient outline, throughout the Gupta inscriptions, from the Allahabad pillar to Budha Gupta's record at Erun and even on to Toramána's inscription at the same place.

The weights of these coins run as follows:—

9 fair specimens of Kumára's mintages average 30.1 grains, highest weight 33 grains.

8 fair specimens of Skanda's coinage average 31.7 grains, highest weight 35 grains.

Dr. Swiney's coin of Buddha, No. 55, Pl. II. J. R. A. S. XII. weighs 32 grains.

Their relative rarity may be approximately inferred by the numbers of the coins of each prince in the Stacy, my own, and Mr. Freeling's collections.

	Stacy.	Thomas.	Freeling.
Kumára's	6	6	7
Skanda's	4	4	1
Buddha's	0	0	0
Doubtful,	2	1	1
	<hr/>	<hr/>	<hr/>
Total,	12	11	9

These coins of the peacock type would seem to have formed the recognised silver currency of the central and Eastern provinces of the Gupta dominions, for though they are found in limited numbers amid the hoards of the local coinage of the Western states. The relative proportions seem to be reversed in the *finds* of the Eastern districts of the Gupta empire. Three in my own collection have chiefly been obtained from Kanouj itself, while Mr. Freeling's centre of operations is Humeerpore on the Jumna.*

* Prinsep remarks on this head, "Figs. 10, 11, 12, are of a different type, though nearly allied to the former; they are not only found in Gujrát, but at Kanouj, Ujjain, and generally in Upper India. Lt. Cunningham has just sent me impressions of five very well-preserved specimens procured at Benares," IV. 687.

It may be useful to summarize in this place the proved dates, discovered on the various specimens of the peacock coins that I have had an opportunity of inspecting—leaving the consideration of the grounds whereon these determinations are based for future scrutiny.

Kumára's coins bear ciphers for *one hundred and twenty and one* = 121; others display figures for 124—one piece discloses a unit for *five* and another a sign which I doubtfully class as a *nine*, but in both these instances the decimal cipher is obliterated.

Skanda Gupta's money continues the series in the use of the same figure for *one hundred*, with the addition of two new symbols in the decimal place.

Buddha Gupta in like manner dates in the first century of the given era, but the value of his second cipher is undetermined.

The inscription at Sanchi, it is to be remembered, bears date 165.

COPPER COINS.

I notice the copper coins of the Guptas merely to complete the series, as they add nothing of value to the historical enquiry.

Prinsep remarks that they are "much more scarce than the gold coins of the same age, and hitherto only those of one individual of the family have been met with." Varieties of these pieces are engraved in figs. 11, 12 and 15, Pl. XXXVIII. Vol. V. J. A. S. B. These bear the name and titles of Chandra Gupta on the reverse, which may be restored in full as महाराज श्री चन्द्रगुप्त. Nos. 13 and 14, of the same plate in addition to the name have श्री विक्रमादित्य on the obverse, inscribed below the bust of a female offering a flower.*

TORÁMANA

CLASS 4. S. wt. 32 grains, unique and unpublished.

Obverse. The usual Sáh type of profile but with the artistic merits still further diminished. The head is turned the reverse way and looks to the left.

In front of the profile are seen the figures for eighty with the uncertain symbol entered last in the line of Gupta units.

* See also A. A. 427.

Reverse.—Device. Peacock greatly debased and facing more to the left.

LEGEND. वी नीवयकवर्द श्री तोरमान

It will be remembered that this king *TORÁMANA** is adverted to in the following terms in the inscription on the *Varáha* image at Eran in Bhopál. “When the great *rāja TORÁMANA*, the very famous and beautiful, the king of kings, governed the earth ; in the first year of his reign, on the 10th day of *Phálguna*.”

Jas. Prinsep, in noticing this monument, in connexion with the Budha Gupta record on the associate pillar, prefaces his translations with a summary of the relative dates of each inscription as illustrated by their respective contexts.† He observes, “The temple was built by Dhanya Vishnu the confidential minister of *Rāja Mátri Vishnu*, the son of *Hari Vishnu*, grandson of *Varuna Vishnu* and great grandson of *Indra Vishnu* ; in the first year of the reign of *Torámana* of *Suráshtra* (?) : and (sic)

“The pillar was erected by *Var’dala Vishnu*, the son of *Hasti Vishnu*, also grandson of *Varuna Vishnu*, and at the cost of *Dhanya Vishnu* on the 14th of *Asarh* in the year 165, in the reign of *Bu-*

* Prinsep writes the name *Tárapáni* : I follow Major Cunningham’s emendation, which indeed is necessitated by the legend of the coin (*Bhilsa Topes*, 164).

† I also transcribe Major Cunningham’s observations on this subject :

“We learn from the inscriptions on the colossal *Varáha Avatar*, at Eran, that the paramount sovereign *Toramána* possessed all the country about *Bhupál* and southern *Bundelkhand* not many years after the elevation of *Budha Gupta*’s pillar ; for the pillar was erected by *Vaidala Vishnu*, at the expense of his cousin *Dhanya Vishnu*, while the colossal Boar was set up by *Dhanya Vishnu* himself. The death of *Budha Gupta*, and the accession of *Toramána*, therefore both took place during the life-time of *Dhanya Vishnu*. But there must have been an interval of some years between the two events, as *Dhanya*’s elder brother, *Mátri Vishnu*, who is not even mentioned in the pillar inscription, had since assumed the title of *Mahárāja*, and was then dead. *Dhanya* himself then became regent, apparently to the young prince, *Toramána* ; for, in another inscription from the Fort of *Gwalior*, I find *Toramána* described as the son of *Mátri Dása* and the grandson of *Mátri kula*, who is probably the same as *Mátri Vishnu* [?] As the celebrated hill of *Udayagiri* is mentioned in the *Gwalior* inscription, there can be little doubt of the identity of the two *Toramánas*, and of the consequent extension of the principality of Eran to the banks of the *Jumna*.” *Bhilsa Topes*, p. 164.

dhā Gupta in *Surāshtra*, comprehending the country between * * the *Kalindī** or Jumna and the *Narmada*, or Nerbudda."†

Prinsep was clearly disposed to infer that the temple was built prior to the erection of the pillar, and in this supposition I myself was formerly inclined to concur ;‡ but the degradation of the type

* I had previously expressed distrust in the accuracy of the transcription of this name by JAS. PRINSEP (J. R. A. S. XII. 71,) I did so on the very justifiable ground that his own accompanying facsimile did not warrant such a rendering. Major Cunningham has since examined the original inscription and has satisfied himself that the word is *Kāḷindī* (*Bhilsa Topes* 163.)

† J. A. S. B. VII. 632.

‡ I insert the entire passage. "Budha Gupta the very name that is found on the inscription on Bhīm Sen's Pillar at Erun, near Sāgor. Assuming this designation to be correctly read, the collateral evidence derived from the inscription coincides sufficiently with the indications offered by the coins themselves. From the former we gather that Budha Gupta held the country lying between the Nerbudda and a river it has been proposed to identify as the Jumna; no information is however afforded as to the whereabouts of his seat of government, nor can the geographical boundaries, thus defined, be said to convey any very definite knowledge of the real extent of the dominions adverted to. Prinsep considered that *Surāshtra* should be held to have constituted a portion of this king's possessions, but the expressions in his own translation of the inscription—even admitting it to be an accurate rendering—are far from implying any such condition; the occupation of land touching these two rivers, taking Sāgor as anything like its centre, would encircle comparatively narrow limits, and would not by any means of necessity embrace the whole land to the western coast.

If Budha Gupta is to be looked upon as a scion of the ancient family of the Guptas, whose might is chronicled on the Lāts of Allahabad and Bhitāri, and on the Rock of Junagarh, it is clear by his subjects' own showing, that he possessed a sovereignty much reduced in extent from the empire originally ruled over by his predecessors in the palmy days of the race.

In addition to the Pillar record, there is also an inscription on the temple at Erān, near which the Pillar itself was erected. From the incidental notices to be found in these monumental writings, it would appear that their execution must have been very nearly contemporaneous; the one work having been undertaken "by," the other at the "cost of," a certain Dhanya Vishnu. In the temple inscription, which is probably the earliest of the two, it is stated that the edifice itself was built in the first year of the reign of Tārapāni, the suzerain then acknowledged in this part of the country. The writing on the pillar, on the other hand informs us, as has been already stated, that at the time of its endorsement, Budha Gupta was the lord paramount." J. R. A. S. XII. 71.

of Taramána's imitation of the Gupta Peacock coins places the matter beyond a question, and would leave me no alternative but to conclude that Toramána *followed* Buddha Gupta, after some considerable interval—but my late admission of Buddha Gupta into the direct succession of the Gupta kings, which has been freely conceded on the absolute identity of the style of his silver money with that of the newly deciphered pieces of Kumára and Skanda Gupta, has already sanctioned the result claimed by the present discovery.

But this unique specimen of Toramána's mintage furnishes us with further matter of speculation, in such portion of the date as still remains on its surface. The cipher for hundreds, which should appear opposite the forehead of the profile, seems to have been worn away in the course of the ordinary currency of the piece. The decimal figure is sufficiently well preserved, and though it would be possible to read it as the 5 for *one hundred*, yet both its position and its outline alike claim for it the value of *eighty*; lowest in order appears a symbol which equally suggests a remote doubt, and were there any figure or portion of a figure in the space below, it might be taken for a θ , but not only is there no cross-bar to complete that sign, but there is a semblance of an up-stroke beyond the second vertical line, which assimilates it with the Gupta unit entered last in the line in the plate of facsimiles.

If these interpretations be correct, we have Budha Gupta dating up to 165, and Toramána issuing coin in what we may fairly conclude to be *one hundred* and *eighty* odd, or about the very period that might have been selected for his epoch under other grounds.

The style of the coin legend also demands brief notice. It will be seen that the Gupta numismatic practice of arranging both the short and long vowel *i* *above* the line of matras, (or more frequently omitting them altogether) is here so far modernized that the short \bar{i} is brought down before, and the long \bar{i} after the consonant to which it is attached. The Budha Gupta Inscription at Erun like the Skanda Gupta writing at Kuháon still continues to use the *old* form of the long vowel, while the Toramána record symbolizes the sound by a character similar to that on the coin.

The short vowel, on the other hand, is already fully subjected to the modified mode of expression in the Buddha Gupta inscription.

The Gujrát copper-plates of later days do not however, accept these new forms, but adhere to the general outline of the ancient superposed vowel.*

Further remarks on the different species of Orang-utan.—By
EDWARD BLYTH.

Our museum having received from Sir James Brooke of Sarawák the superb donation of seven skeletons of large adult Orang-utans, I hasten to communicate the results of my examination of them, as a sequel to my former memoir on the genus published in the 22nd volume of the Society's Journal.

Of these seven skeletons, five are referable to the *Mias Rambí* of Sir J. Brooke; although one of them (a small but full grown female) is marked by himself *M. Pappan*; and another is sent by the new name *M. Chapin*, which is also that of an old female animal, remarkable for its extraordinarily large and vertically elongated orbits. It is probable that this alleged *Chapin* merely represents an individual variation; and Sir J. Brooke states, in his letter announcing the presentation, that some of these skeletons had been labelled by him with the names specified by natives, who, accordingly (as may be supposed in such a case), are not particularly conversant with the osteological distinctions of the different species.

The sixth skeleton is that of an old female of the *Mias Pappan*, with double-crested skull like that of the *male* figured in illustration of my former memoir. It even exceeds that male in size, but the skull is smaller; and the sexual distinctions of the two are unmistakeable. In this female, the epiphyses of the limb-bones, *scapulæ*, *ilia*, &c. are thoroughly anchylosed, denoting completion of growth; even the *symphysis pubis* is united (with much irregular deposition of bone externally), and the sacro-iliac symphysis on the right side only. In no other of our Orang skeletons are the

* Wathen, J. A. S. B. VI.

two latter symphises united. Our male *Pappan* had not quite completed his growth; for some of the epiphyses are loose, and others are but partially soldered: those of the *humeri* are fixed and semi-anchylosed; as are also those of the left *radius* and *ulna*; but the epiphyses of the right *radius* and *ulna* are detached; those of the *scapulæ* and *ilia* are fixed but slightly, and those of the *ischia* more extensively. This animal had therefore (as will be attempted to be shown presently) not completed its full growth: the female being much more advanced in age, with its teeth proportionally worn down. On comparison of the skulls of the two sexes, that of the female is seen to be smaller, with the maxillæ less protruded, increasing the facial angle from 32° to 35° ; the zygomatic arch is much less robust; and the longitudinal grinding surface of the upper molars less by $\frac{3}{16}$ in., while that of the lower molars is less by $\frac{1}{4}$ in. than in the youthful male presented by Mr. Nicholls, and by $\frac{7}{16}$ in. than in Dr. Clarke Abel's Sumatran male. In the form of the ascending ramus of the lower jaw, this female specimen more nearly resembles the Sumatran male referred to than any other of our numerous specimens; but the condyle is considerably larger; and, as compared with Mr. Nicholl's Bornean male, the antero-posterior diameter of the ascending angle is much less; being in the Bornean male (on a level with the surface of the grinders) $2\frac{5}{8}$ in.,—in Abel's Sumatran male but $2\frac{1}{4}$ in.,—and in Sir J. Brooke's Bornean female $2\frac{1}{2}$ in. Lastly, this Bornean female presents the very extraordinary anomaly (throughout the series of placental mammalia) of a fourth true molar above and below, though on the left side only: that of the upper jaw being of small size and round form, its crown scarcely exceeding that of an upper false molar of *MACACUS RHESUS*; and it is placed posteriorly to the ordinary last true molar on a line with its outer surface, that tooth having been pressed a little inward: in the lower jaw the accessory fourth true molar is very little smaller than the normal molars; and it projects from the internal margin of the anterior surface of the ascending angle of the jaw, its crown being directed obliquely inwards much more than forwards or upwards: as a functional tooth, it must, therefore, have been almost useless; though the outer or upper margin of its crown is a little worn down by attri-

tion, as is also the outer cusp of the small accessory molar above. This old female *Pappan* had been badly wounded in its day; having had its left humerus severely fractured, and the fibula of that side also broken; the fractured bones having healed; the unset humerus, however, in an extraordinary manner, exhibiting two large and deep perforations in the great lumpy mass of united bone, where suppuration had ensued, and large shot had probably been ultimately discharged from the orifices.

The seventh skeleton is that of a species altogether distinct and new! Although that of a large old male, with the cranial sutures much obliterated, and the ankylosis of the epiphyses of its limb-bones complete, it is very remarkable for the comparatively slight protrusion of the jaws, and the consequently increased facial angle; apparently, however, to a greater extent than really, from the flatness of the face, the unusually slight protrusion of the sockets of the upper incisors, and, above all, the elevation of the condyle of the lower jaw raising so considerably the occipital portion of the skull and consequently the auditory orifice. The facial angle does not actually exceed $32\frac{1}{2}^{\circ}$; while in the two *Rambis* (male and female) figured in my former memoir, it is as low as 30° —(this being also Prof. Owen's estimate of his adult skulls of the *Rambi*). The *zygomata* (or cheek-bones) are unusually prominent. The canines, incisors, and the first three upper molars on each side, are exceedingly much worn down by attrition; the canines even to a level with the other teeth: but the circumference of these canines, especially in the lower jaw, is conspicuously less than in males and even large females of the *Rambi* and *Pappan*; though they are proportionally larger than in the *Kassar*. It is further remarkable that the frontal ridges of the skull, instead of uniting upon the vertex to form a single sagittal crest (as in the *Rambi*), or continuing separate and well apart throughout (as in the *Pappan*), approach to contact upon the vertex but without uniting; which is very likely to prove a constant and specific distinction, as the present old male shews much irregular deposition of bone externally to its contiguously double sagittal crest. The long bones of the limbs, though fully as stout as in the *Rambi* and *Pappan*, and about twice as stout as those of our old female *Kassar*, yet probably do not exceed the

corresponding bones of the full grown male *Kassar* in length; being very much shorter than those of the adult *Rambi* and *Pappan*: and this remarkable brevity of limb, combined with the conspicuous differences in the skull and sundry other distinctions, can scarcely be considered otherwise than as indicative of specific peculiarity.

Of the five *Rambis* sent, there is unfortunately no specimen of a male of the largest size, comparable to that of which the skull is figured in the 1st and 2nd plates accompanying my former memoir: but there are two large full-grown females (including that ticketed *Mias Chapin*), and also a full grown female of smaller dimensions (which was labelled *M. Pappan*;) with a male of superior age and stature to the male *Pappan* presented formerly by Mr. Nicholls; and also a young male, with the last molars brought into wear, but which nevertheless had not nearly attained its full growth, which bade fair to rival that of the gigantic Sumatran male already noticed.

The specimen to which the name *Mias Chapin* was attached, appears (as already mentioned) to be a large old female *Rambi*, very remarkable for the enormous size and vertically elongated form of its orbital cavities, which measure 2 in. by nearly $1\frac{3}{4}$ in. across. Its skull is larger, though less massive, than that of the female *Rambi* figured in my former memoir: the muzzle is conspicuously more slender, measuring but $2\frac{5}{8}$ in. in greatest width (outside the canines), instead of $2\frac{7}{8}$ in.: and whereas the coronoid process of the lower jaw in the former specimen is smaller and about on a level with the condyle, in the present example (labelled *Chapin*) the posterior or condyle process is unusually prolonged, and raises the skull (with lower jaw *in situ*) so remarkably, that placing it on a level surface together with the other skull noticed, the zygoma of the so-called *Chapin* not only overlaps that of the other, but its lower edge is about $\frac{1}{16}$ in. higher than the upper edge of the zygoma of the other specimen:* the nasal bones, which in the other are united and ascend to the very summit of the *glabella*, in this skull continue separate, and reach only to the lower portion of the *glabella*. This skeleton is very deficient, wanting the *sacrum* and most of the bones of the hands and feet: but all of the long bones are present, with

* In Prof. Owen's figure of a female *Rambi* skull (*Zool. Trans.* I, pl. 35), the condyle-process is similarly elongated.

the shoulder-blades and rest of the *pelvis*; the epiphyses being completely soldered. The limb-bones are even rather longer than in the great female *Pappan*, and in fact exceed in length those of any other of our full-grown specimens: the *humerus* measuring 15 in.; the *ulna* (to tip of styloid process) $15\frac{3}{4}$ in.; femur $11\frac{1}{2}$ in.; and tibia $10\frac{1}{3}$ in.: circumference of middle of trunk of humerus $3\frac{1}{4}$ in.; and of femur $2\frac{7}{8}$ in. The few digital bones seem to accord in dimensions with the corresponding bones of our male *Pappan*. The extreme length of the *scapula* is $8\frac{7}{8}$ in.; and of *pelvis* $10\frac{7}{8}$ in.: clavicle 8 in. This specimen is marked as having been procured in Sadong (in Borneo).

The next specimen, which was erroneously marked *Pappan*, we consider to be a small female *Rambi*, though fully mature and even old, as shewn by the almost complete obliteration of the cranial sutures, the anchylosis of the various epiphyses, and the amount of attrition of all the teeth. The cranial ridges are very small; and the sagittal crest is hardly at all raised, but nevertheless exhibits a tendency to rise along the median line of the skull, between the frontal ridges which converge from the temples, and to be prolonged in front, anterior to the convergance of the latter, which takes place unusually far back: the nasal bones are united and singularly minute, actually not rising so high as the wide part of the orbital cavities; and the latter are small and circular, measuring barely $1\frac{3}{8}$ in. every way. The skull considerably resembles that of the female *Rambi* formerly figured, only that the sagittal crest is so much smaller; the *zygomata* being also more raised (in consequence of the greater prolongation of the condyle process of the lower jaw); and the orbits are smaller and more circular, and surmounted by much slighter ridges: consequently the face is flatter, and the sockets of the incisors are also less protruded. The skeleton is unfortunately very imperfect, wanting most of the bones of the hands and feet, and one *tibia* and *fibula*: a portion of the lower jaw, with the canine, first præ-molar, and part of the second, is also lost: but the other long bones are present, and the *pelvis* is complete. Length of *humerus* but $13\frac{1}{2}$ in.; of *ulna* $13\frac{7}{8}$ in.; of *femur* $10\frac{3}{8}$ in.; and of *tibia* 9 in.: circumference of middle of *humerus* $2\frac{7}{8}$ in.; and of *femur* $2\frac{3}{4}$ in.: metacarpal bone of middle finger $3\frac{1}{8}$ in.; metatarsal of

corresponding toe $3\frac{3}{4}$ in.: *os calcis* 2 in. Total length of scapula (with *acromion*) $1\frac{1}{8}$ in.; and of *pelvis* $9\frac{7}{8}$ in.: extreme breadth apart of the *ilia* (or hips) $10\frac{7}{8}$ in.: clavicle $6\frac{3}{8}$ in. This specimen also is marked from Sadong in Borneo.

The third female *Rambi* is of large size and fully mature, with the various epiphyses well soldered: but it has even less trace of sagittal crest than the last; the frontal ridges meeting as far back upon the skull, but not quite uniting, and a small mesial ridge rising between them above the vertex: the orbits are moderately large and a little elongated vertically, measuring $1\frac{5}{8}$ by $1\frac{1}{2}$ in.; and the nasal bones are united and ascend a little into the glabella. Size about that of the first specimen (marked *Chapin*), but the muzzle rather broader or $2\frac{1}{16}$ in. This specimen is nearly perfect: but the face is disfigured by a bullet which had knocked away the inner half of the right orbit and a tolerably large piece from the occiput; which fragments are lost. Length of *humerus* $14\frac{3}{4}$ in.; *ulna* $15\frac{1}{4}$ in.; *femur* $11\frac{5}{8}$ in.; *tibia* $10\frac{1}{8}$ in.: circumference of middle of trunk of *humerus* 3 in.; and of *femur* $2\frac{3}{4}$ in.: metacarpal bone of second or middle figure $4\frac{5}{16}$ in.; first phalanx of ditto $3\frac{1}{16}$ in.; second phalanx $1\frac{1}{16}$ in.: metacarpal bone of thumb $2\frac{1}{8}$ in.; first phalanx of ditto $1\frac{3}{16}$ in.: metatarsal bone of middle toe $3\frac{1}{16}$ in.; first phalanx of ditto $3\frac{1}{8}$ in.; second phalanx $1\frac{3}{4}$ in.: metatarsal bone of hallux $2\frac{1}{16}$ in.; first phalanx of ditto $1\frac{3}{16}$ in.; and ungual (!) $\frac{1}{16}$ in. Total length of *scapula* $9\frac{1}{4}$ in.; *clavicle* $7\frac{5}{8}$ in.; extreme length of *pelvis* $11\frac{1}{4}$ in.; and extreme breadth of *ilia* 12 in.

The two remaining *Rambis* are males: and the first to be noticed is a young animal, whose skull had obviously not attained its full dimensions, though the last true molars had been brought into wear: but the general massiveness of this skull indicates that the animal would probably have become a male of the largest size: the sagittal crest had begun to rise on a grand scale; and the frontal ridges converge directly to it, although these are scarcely indicated for $\frac{3}{4}$ in. before their junction. The teeth are more crowded than in the full grown animal; the inter-space between the upper canine and outer incisor, which in our large Sumatran male is $\frac{2}{8}$ in., being scarcely $\frac{1}{4}$ in.; and the first false molar, instead of being completely posterior to the canine, advances considerably on its outer surface

posteriorly: in the lower jaw, also, there is a bony inter-space between the canine and first false molar in the large mature male, but not in the adolescent male: nasals partially anchylosed, and continued upward to the lower part of the *glabella*: epiphyses of the *humeri* considerably anchylosed, and also those of the *tibiæ* and *fibulæ*; but not of the *radii* and *ulnæ*. This skeleton also is tolerably complete. Length of *humerus* $14\frac{3}{8}$ in.; of *ulna* $13\frac{3}{4}$ in.; of *femur* 10 in.; and of *tibia* 9 in.: circumference of middle of trunk of *humerus* $2\frac{1}{2}$ in., and of *femur* $2\frac{1}{8}$ in.: metacarpal bone of middle finger (the epiphyses beginning to anchylose) $3\frac{3}{4}$ in.; first phalanx of ditto $2\frac{7}{8}$ in.; second phalanx $1\frac{7}{8}$ in.: metacarpal of thumb $1\frac{7}{8}$ in.: metatarsal of middle toe $3\frac{9}{8}$ in.; first phalanx of ditto $2\frac{3}{4}$ in.; second $1\frac{5}{8}$ in.: metatarsal of hallux $1\frac{7}{8}$ in. Clavicle $6\frac{1}{8}$ in. Extreme length of *scapula* (minus epiphysis) $7\frac{1}{2}$ in.: of *pelvis* (with ischial but not iliac epiphysis) $9\frac{3}{4}$ in.; and extreme breadth at the hips $10\frac{1}{8}$ in.

The next is a mature male, but certainly not of the largest dimensions: being about the size of the great females already described; and not otherwise recognisable from them than by the general massiveness of the skull (which is remarked at the first glance), and less conspicuously than usual in the present instance, by the form of the *pelvis*. The superciliary ridges are much broader than in any female skull; and the *zygomata* equally robust: the sagittal crest is also broad and well developed: nasals distinct, and reaching up to the lower part of the *glabella*. Skeleton tolerably complete; wanting most of the ungual phalanges and some other small bones. Length of *humerus* $14\frac{3}{4}$ in.; of *ulna* (with loose epiphysis) $15\frac{1}{8}$ in.; of *femur* $11\frac{1}{8}$ in.; *tibia* $9\frac{7}{8}$ in.: circumference of middle of trunk of *humerus* $3\frac{1}{8}$ in.; and of *femur* $2\frac{3}{4}$ in.: metacarpal bone of middle finger $4\frac{1}{4}$ in.; first phalanx of ditto $3\frac{1}{8}$ in.; second phalanx $1\frac{1}{8}$ in.: metacarpal of thumb $1\frac{3}{8}$ in.; first phalanx $1\frac{1}{8}$ in.: metatarsal of middle toe $4\frac{1}{8}$ in.; first phalanx of ditto $2\frac{1}{8}$ in.; second phalanx $1\frac{1}{8}$ in.: metatarsal of hallux $2\frac{1}{8}$ in.: clavicle $7\frac{1}{4}$ in.: *scapula* $8\frac{3}{8}$ in.: *pelvis* $10\frac{3}{4}$ in. in extreme length, and $11\frac{3}{4}$ in. broad at the hips. This specimen was marked *Mias Rambai* by Sir J. Brooke; and is also from Sadong in Borneo: the three skeletons received from Sadong having unfortunately been prepared by interment in the

ground; and the present being the most complete of them and otherwise the least injured.

We now come to the female *Pappan* already noticed; which, though of greater size than the male described on a former occasion, with considerably longer and broader *pelvis*, has nevertheless a smaller skull, less prominently developed jaws, and conspicuously smaller teeth: the zygomatic arch is shorter and a little weaker than in the male; but the superciliary ridges and width of the bony orbits are much the same, and in fact there is little further difference between the two skulls: the bony crests on the vertex are less prominent in the female, and they approach to within $\frac{3}{4}$ in. of each other; whereas in the male they remain 1 in. apart where most approximated: length of base of skull, from between the middle incisors to the anterior margin of the occipital foramen, $6\frac{7}{8}$ in. in the male, and $6\frac{1}{8}$ in. in the female: breadth of *zygomata* apart $6\frac{5}{8}$ in. in both. This skeleton is also nearly perfect. Length of *humerus* 15 in.; of *ulna* $15\frac{5}{8}$ in.; *femur* $11\frac{1}{8}$ in.: *tibia* $10\frac{3}{8}$ in.: circumference of middle of trunk of *humerus* $3\frac{1}{4}$ in.; of *femur* 3 in.: metacarpal bone of middle finger $4\frac{1}{8}$ in.; first phalanx $3\frac{1}{8}$ in.; second $1\frac{1}{16}$ in.: metacarpal bone of one thumb 2 in., of the other somewhat less, and bearing a very short first phalanx, only $\frac{7}{8}$ in.; metatarsal bone of middle toe 4 in.; first phalanx 3 in.; second $1\frac{3}{8}$ in.: metatarsal of hallux $2\frac{1}{8}$ in.: clavicle $7\frac{1}{4}$ in.: *scapula* $8\frac{1}{2}$ in. in extreme length: and *pelvis* $10\frac{5}{8}$ in. long, and $11\frac{3}{4}$ in. broad at the hips.

Lastly, we arrive at the new species, which may be designated *PITHECUS CURTUS*. It is perhaps the genuine *Mias Chapin* of the Dyaks. The specimen is decidedly male, and well advanced in years; and the skull has a more anthropoid appearance than that of any other Orang known. This chiefly results from the much reduced prolongation of the muzzle, while the cheek-bones project remarkably, giving a sort of Kalnuk expression to the skull! The absolute projection of the maxilla, in a horizontal line carried from the lower margin of the orbital ring, is, in our large Sumatran male *Rambi* skull, fully 3 in.; in the male *Pappan* it is about the same; in the female *Pappan* $2\frac{1}{2}$ in.; in the old female *Kassar* (a much smaller animal) about $2\frac{1}{4}$ in.; and in the great male *CURTUS* barely 2 in.! Extreme breadth of *zygomata* 7 in.: height of the skull, with lower

jaw *in situ*, 11 in.: length, in a straight line, from the summit of orbital cavity to between the incisors, $4\frac{1}{4}$ in. (the same measurement being in the male *Rambi* $5\frac{1}{8}$ in., and in the male *Pappan* $4\frac{5}{8}$ in.): length from occipital foramen to base of upper incisors 6 in. (in the male *Rambi* $7\frac{1}{8}$ in., and male *Pappan* $6\frac{7}{8}$ in.): length of bony palate 3 in. (in the others $3\frac{7}{8}$ in., and $3\frac{5}{8}$ in.): orbital cavities $1\frac{5}{8}$ by $1\frac{1}{2}$ in. across: extreme width of bony orbits apart externally 5 in.: extreme breadth of ascending ramus of lower jaw $3\frac{7}{8}$ in.; height of the condyle $4\frac{3}{8}$ in.; length of grinding surface of the upper molars $2\frac{1}{16}$ in. The skeleton is fortunately nearly perfect. Extreme length of *humerus* $13\frac{1}{4}$ in.; *ulna* $14\frac{3}{16}$ in.; *femur* $10\frac{3}{16}$ in.; *tibia* $9\frac{3}{8}$ in.: circumference of middle of trunk of *humerus* $3\frac{1}{4}$ in.; of *femur* $2\frac{7}{8}$ in. (length and circumference of *humerus* of old female *Kassar* $12\frac{3}{4}$ and $2\frac{1}{4}$ in.; ditto of *femur* $9\frac{7}{8}$ in. and $2\frac{1}{4}$ in.): length of metacarpal bone of middle finger $3\frac{7}{8}$ in.; first phalanx of ditto $2\frac{1}{16}$ in.; second $1\frac{1}{16}$ in.; metacarpal bone of thumb $2\frac{1}{16}$ in.; first phalanx $1\frac{1}{8}$ in.; metatarsal bone of middle toe $3\frac{1}{16}$ in.; first phalanx $2\frac{3}{4}$ in.; second $1\frac{5}{8}$ in.; metatarsal bone of *hallux* 2 in.; clavicle $6\frac{7}{8}$ in.: extreme length of *scapula* $8\frac{3}{4}$ in.: of *pelvis* $10\frac{1}{8}$ in.; and breadth at the hips 11 in. Length of the vertebral column, from atlas to *sacrum*, measured internally, $16\frac{1}{4}$ in.; in the scarcely full grown male *Pappan*, $17\frac{1}{2}$ in., and in the old female *Kassar*, $15\frac{1}{4}$ in.: axis-vertebra soldered to the next. As compared with the *Rambi* and *Pappan*, the metacarpals and metatarsals are shorter, and the first phalanges of the fingers and toes are longer.*

* A friend who has resided long in Borneo, and has examined numerous skulls of Orang-utans (including those which have passed through the hands of Sir J. Brooke), informs me that he has remarked that, in the adult and aged specimens of the *Rambi* and *Pappan*, the canines are always perfect; whereas in those of the small *Kassar* they are as regularly broken or worn down to about a level with the incisors. This remark is borne out by the series of skulls now under examination. The canines are long and unbroken in all the specimens of the *Rambi* and *Pappan*; and are ground down in the old female *Kassar*, and also in the old male *P. CURTUS*! Denoting probably a difference of food. Moreover, the same gentleman informs me that different species of these animals do not appear to inhabit the same district; and he thinks that the *P. OWENI* represents, in the southern part of the great island, the *P. MORIO* of the northern part.

With the grand series of skulls and skeletons of adult Orang-utans now subjected to examination, amounting to twelve in all (*viz.* 3 males and 4 females of *PITHECUS BROOKEI* or *Mias Rambi*, 1 male and 1 old female of *P. SATYRUS* or *M. Pappan*, one old male of the *P. CURTUS* or *M. Chapin?*, an old female of the *P. MORIO* or *M. Kassar*, and the adolescent female with short fore-arms, provisionally designated *P. OWENII*,—in addition to Prof. Owen's excellent lithographs of the male *Kassar* and of male and female *Rambi* in the *Trans. Zool. Soc.*, Vols. I and II), the observer is first struck with the very obvious and conspicuous distinctness of the comparatively puny *Mias Kassar*, and of the adolescent small skeleton, from all the rest. The next glance suffices to separate the *Rambi*, *Pappan*, and *P. CURTUS*: the last being quite as thoroughly distinguished apart by the *tout ensemble* of its appearance, as the *Pappan* is by its conspicuously double-crested vertex. I should think that no zoologist, accustomed to the discrimination of specific characters, would hesitate, with the present series of skulls before him, to acknowledge the distinctness of each of these three; but such an observer would ponder for awhile over the remarkable female *Rambi* skull with enormous and vertically oblong orbits, and would doubtless hesitate in regarding it as specifically identical with the old female *Rambi* of small size; so great is the contrast between them. Presuming, however, that he arrived at the conclusion here ventured upon, it still follows that the *Rambi* is subject to an extraordinary amount of variation for a wild animal; and this, although it may not invalidate the opinion of its distinctness from the *Pappan* and *P. CURTUS*, nevertheless prompts a reconsideration of the grounds for the view formerly expressed, with regard to the specific distinctness of the small specimen having short fore-arms. From the detached state of the epiphyses of its limb-bones, it is certain that that specimen was not full-grown; and as those of the *ulnæ* at least (as shewn by the skeleton of the adult male *Rambi*, and also by that of the male *Pappan*,) are the last to become ankylosed, it should follow that the fore-arm continues to increase in length after the upper arm and the leg had ceased to grow: but the difference is still too great to be thus accounted for satisfactorily: and upon re-comparison of this specimen with the undoubtedly aged female *Kassar*, I deem it

prudent to await the further evidence which Sir J. Brooke has kindly promised that he would endeavour to procure and send, before venturing to confirm or modify my previously expressed opinion on the subject.

This fact would appear certain, that the partial anchylosis of the epiphyses of the limb-bones does not rigorously denote cessation of growth: unless the female Orangs attain to greater stature than the males, which is most unlikely. It would seem rather, that as the earthy salts are continuously absorbed and re-deposited, some continuance of extension supervenes, until finally checked and stopped by the considerably increased deposition of bone. The skull also continues long to increase in size, after the last true molars have been brought into use.

As regards the sexual distinction, a practised eye discerns it readily in the adult skull, by its superior general massiveness in the male; and, in the skeleton, the larger and broader *pelvis* of course denotes the female animal, combined with a proportionally smaller and less robust skull than in the other sex. There is no reason to doubt the correct determination of sex in any one of the specimens here noticed.

The occasional but rare occurrence of the ungual phalanx to the *hallux* or great toe, would seem to be proper to no particular sex or species; for it exists in our male *Pappan* from Sumatra, and in our female *Rambi* from Borneo.

It now remains to connect the osteological with the external characters of the different species; to determine the stature attained by the largest males of the *Rambi*, *Pappan*, and also *Kassar*, to obtain further information of the *PITHECUS CURTUS*, and to verify or otherwise the *P. OWENII*. With the powerful aid of the accomplished Raja of Sarawak, we trust to be enabled ere long to resolve these various problems.

Indian Oology.—By W. THEOBALD, *Junr. Esq., Calcutta, October, 1855.*—(Continued from Vol. xxiii, p. 603).

- | | | | | |
|---|--|---|------|--|
| 1 | <i>Milvus ater</i> , | Calcutta, October 4th, 3. O. P. | 2.21 |Greenish-white, spotted and blotched with pale reddish brown; nest of sticks, bulky, placed in tall trees. |
| | | | 1.68 | Pure white. |
| 2 | <i>Gyps bengalensis</i> , | near Deoghur, November 4th, 1. O. P. | 3.20 | Nest of sticks, usually small for the size of the bird, and placed at the top of cotton trees or others, very difficult to ascend. |
| | | | 2.52 | Pure white. |
| 3 | <i>Buceros cavatus</i> , | Tenasserim, February 3rd, ... 1. O. P. | 2.68 | In holes of trees, in which the female is built in with mud by the male, as observed by Capt. Tickell (p. 279, <i>ante</i>). |
| | For the measurement of an egg, I am indebted to Capt. Tickell, who was fortunate enough to observe the female on the nest. | | 1.88 | Pure white. |
| 4 | <i>Buceros subruficollis</i> , | Tenasserim, February 3rd, ... 3. O. P. | 2.20 | Mode of incubation said to be similar to the last. |
| | | | 1.55 | Pure white. |
| 5 | <i>Halcyon smyrnensis</i> , | Mergui, March 4th, ... 5. B. O. | 1.20 | Gallery 1½ feet in a stiff bank, near a road. |
| | | | 1.03 | Pure white. |
| 6 | <i>Halcyon gural</i> , | Monghyr, June 4th, ... 4. R. | 1.09 | Gallery 1 foot in a stiff bank in jungle. |
| | | | 1.02 | |

7	<i>Merops erythrocephalus</i> ,	Mergui, March 3rd, ...	5.6 B. O.	Pure white. Gallery from 1 to 7 feet in length, in soft sandy soil near water. It enters the ground at a small angle and then runs horizontally.
			0.84	
			<hr/>	
			0.76	
8	<i>Eudynamys orientalis</i> ,	Monghyr, June 3rd, ...	1. O. P.	Pale dirty green, much blotched with reddish brown. I had but one egg brought, and the man reported four crow's eggs in the same nest.
			1.20	
			<hr/>	
			0.90	
9	<i>Centropus rufipennis</i> ,	Monghyr, June, ...	4. O.	Pure white; nest placed in dense trees, a neat but loose structure of twigs domed, and with aperture in the side lined with dried leaves.
	"Mahóka" "Karnówa"		1.30	
			<hr/>	
			1.09	
		August,...	1.47	
			<hr/>	
			1.21	
10	<i>Cypselus affinis</i> ,	Monghyr, May, June,...	4. O. P.	Pure white: nest described in a former paper. Mr. Layard, however, describes it as building a <i>rud</i> nest in Ceylon (vide Annals for 1853, page 311).
			0.90	
			<hr/>	
			0.56	
11	<i>Cypselus balasiensis</i> ,	Monghyr, June 3rd, ...	3. L. P.	Pure white: nest of vegetable down, with a few feathers agglutinated with mucus to the frond of the <i>Borassus</i> .
			0.80	
			<hr/>	
		Prome, July,...	0.45	

- 12 *Corvus culminatus*, ... Tenasserim, February 3rd, ... O. P. Dull sap-green, much blotched with brown. 1.66
Near Deoghur, March 4th, ... 1.15
Nest carefully placed in tall trees.
- 13 *Acridotheres tristis*, Monghyr, June 1st, ... 5. O. P. Pale green. Nest in trees or holes in houses, of grass and rubbish. 1.20
Prome, July 3rd, (2nd brood) 0.85
- 14 *Sturnus contra*, Monghyr, May 3rd, ... 5. O. P. Clear pale green. Nest of grass and twigs in trees. 1.10
June 3rd, ..
Tavoy, April 1st, ... 0.82
- 15 *Malacocercus bengalensis*, ... Monghyr, June 2nd, ... 5. B. O. P. Deep bluish green. Nest of twigs and fibres in bushes. 1.00
"Fat-gobia," "Gogai,"
0.79
- 16 *Malacocercus caudatus*, ... Monghyr, June, July, 4.5 Nest and eggs, previously described. O. P.
- 17 *Neornis flavolivacea*, Darjiling, July 2nd, 3. B. O. P. Deep dull claret red, with a darker band at broad end. Nest, a deep cup, outside of bamboo leaves, inside fine vegetable fibres, lined with feathers. 0.69
0.55

- 18 *Orthotomus longicauda*, ...Darjiling, August 4th,... 4. O. P. Greenish-white, dotted with pale reddish.
0.61
Tavoy, May 1st,... 0.45
Nest, a neat cup of fibre and vegetable down, enclosed in a single leaf, which is secured by stitches of fibre; so as to envelope its entrance at the top and beneath the stalk, the leaf serving as an admirable pent-roof to the nest.
- 19 *Thamnobia cambaiensis*, ...Monghyr, April 2nd, ... 3.4 Greenish-white, ringed and spotted with pale reddish, with some spots of neutral. Nest rude, in holes, in trees and banks, of grass and nearly always snake-skin.
O. P.
0.64
- 20 *Hirundo domicola*,Tenasserim, April 2nd,... 3. L. O. P. White, spotted and ringed with umber. Nest a saucer of mud, inner part coarse roots, profusely lined with feathers and vegetable down, attached to the under part of "snags" projecting some 4 feet above the water.
3.77
0.52
- 21 *Hirundo sinensis*,Salween R., January 2nd... 4. O. P. Pure white. Nest of grass and lined with feathers.
0.62
0.48

- 22 *Pycnonotus hæmorrhous*,.....Monghyr, June 4th,... 3. O. P. Nest and eggs like *P. bengalensis*, previously described ; eggs not quite so highly coloured.
0.90
0.68
- 23 *Nectarinia flammaxillaris*, ...Tavoy, February 1st,... 2. O. P. Pale greenish, speckled with greyish ash. Nest, a neat purse, in a lime tree (*Citrus*), like *N. asiatica*.
0.56
0.43
- 24 *Macropygia leptogrammica*, ...Darjiling, July 2nd, 0.—(1 ?).....Dirty white : nest, a few sticks.
1.40
0.98
- 25 *Francolinus sinensis* (var. *Phayrei*), ...Burmah, June 4th, (*Miadeh*),... 4. R. P. Uniform greenish-cream ; on the ground.
1.40
1.15
- 26 *Turnix ocellatus*,Monghyr, June 1st,... 4 R. P. Yellowish-grey, closely freckled with dark yellowish grey, blotched with deep reddish-umber with a few dots of neutral : on ground.
0.88
0.74

- 27 *Glareola lactea*,Tenasserim, March 3rd, ... B. P. (3?) Dusky buff, ringed and spotted with obscure neutral, and irregularly lined with yellowish brown. On churs and river sand-banks.
 1.01
 0.81
- 28 *Edicnemus crepitans*, Deoghur, April 1st, ... 2. O. P. Pale stone-colour or yellowish cream, blotched with deep red brown.
 1.80
 1.35
 On ground in sal jungle.
- 29 *Hoplopterus ventralis*, ...Tenasserim, March 3rd, ... 3. P. Yellowish stone-colour or creamy nankeen, regularly spotted with deep red brown and sparingly blotched with neutral.
 1.60
 1.17
 On sand-banks in the river.
- 30 *Metopodius indicus*,Monghyr, August, ... L. O. P. Clear brownish-ochre, strongly lined and streaked with black,—nest of weeds in jheels.
 1.50
 0.97
- 31 *Hydrophasianus chirurgus*, ...Monghyr, August 2nd, 4. P. Clear brownish or greenish bronze : nest, weeds in jheels.
 1.33
 1.10
- 32 *Ciconia leucocephala*,Deoghur, June 4th, ... 3. P. O. Dull white : nest of sticks placed in tall trees, usually “simul,” most difficult to ascend.
 2.50
 1.90

- 33 *Herodias intermedia*, ... Monghyr, July 1st, 2nd, ... 6. O. P. Full green.
 1.76 Nest small, of sticks; in company
 with "Mainas" and Nos. 34 and
 35.
 1.26
 1.94
 1.30
- 34 *Herodias garzetta*, Monghyr, July 1st, ... 6. O. P. Full green, nest as above—No. 33.
 1.45
 1.14
 1.58
 1.11
- 35 *Herodias bubuleus*, Monghyr, June 1st, ... 6. 8. P. O. Very pale green or greenish-white.
 1.80 Nest as above—No. 33.
 1.39
- 36 *Porzana phœnicura*, Monghyr, August 1st, ... 7. L. O. P. Dark brownish-cream, much spotted
 1.70 and blotched with brownish-red.
 1.10 Nest of weeds in jheels.
- 37 *Gallinula Burnesii*, Salt Range, August 4th, ... 1.62 Pinkish cream or grey, spotted and
 (previously described as *Gallinula chloropus*), 1.15 Nest of weeds in jheels.

38	<i>Dendrocygna awsuree</i> , ... Monghyr, August 1st, ...	8. O. P. Creamy white : nest of weeds in jheels.
		1.81
		<hr/>
		1.50
39	<i>Nettapus coromandelianus</i> , Monghyr, August 1st, ...	O. Pure white, shell very thin.
		1.47
		<hr/>
		1.10

(NOTE.—The nomenclature used above is derived from the valuable catalogue of birds in the Museum of the Asiatic Society, by Mr. Blyth ; a work of great labour, which reflects the utmost credit on its author.)

PROCEEDINGS
OF THE
ASIATIC SOCIETY OF BENGAL,
FOR AUGUST, 1855.

At an ordinary general meeting of the Society held on the 1st inst. at the usual hour,

SIR J. W. COLVILLE, KT. President, in the chair.

The President introduced to the meeting the Rev. Dr. Anderson of the American Oriental Society.

The minutes of the last month's proceedings were read.

Mr. Houstoun called the attention of the chairman to certain entries which he thought were incorrect. The chairman explained that they were generally correct but added the words: "The question was put and carried." The proceedings were then confirmed; when Mr. Houstoun handed in the following protest:—

"I protest against the above as a most incorrect and improper statement."

Presentations were received—

1. From Lt. Harris, one of a trove of 400 copper coins found whilst excavating earth for embankment purposes near Tankpanee, in the Púri district.

2. From the Secretary to the Board of Revenue, specimens of minerals, earths and gold dust sent down by Col. Hanney from Upper Assam.

3. From the Imperial Academy of Bordeaux, through Messrs. Gillander, Arbuthnot & Co., two Nos. of its Proceedings for 1854.

4. From H. B. Maddocks, Esq. Deputy Commissioner, Battala, a trove of copper coins found at Gurudáspur.

Lt. R. Stewart, 22nd N. I., duly proposed and seconded at the last meeting, was balloted for and elected an ordinary member.

In accordance with the reference made at the last meeting the Council submitted the following report on the motion of Mr. Houstoun to the effect that he may be permitted to have access to all papers, the property of the Society.

“The Council reports that the papers, which are the property of the Society, are :

“1st. The Journal Books which contain a record of the proceedings of the Society, of the Council, and of the different Sub-Committees or Sections.

“2nd. The Minutes recorded by the members of the Council or the Sub-Committees and Sections upon questions circulated for decision or consideration.

“3rd. All the correspondence of the Society filed, including copies of the letters written by the Secretary in answer to communications to him, and all the accounts of the receipts and expenditure of the Society, and reports addressed either to the Society or to the Council or Sub-Committees.

“4th. MSS. of papers published and intended to be published in the Journal and not returned to the authors.

“The rules are silent except as to the 1st class. The 101st rule expresses only that every ordinary member may have access, at such times as the Library is open, to the Journal Books of the Society and of the Council. The Council are of opinion that this rule fairly construed, includes also the records of the proceedings of the Committees.

“The Council are further of opinion that every ordinary member ought also to have access to the documents of the 3rd and 4th classes; but that the minutes of members of the Council or of Committees ought not to be inspected as of course; but only on application to the Council for their production, subject to an appeal to a general meeting of the Society, should the Council decline to sanction their production.

“The final decision on every question determined in circulation should be entered in the Journal Books.”

Mr. Houstoun stated that after he had seen the above report in the printed proceedings, he would state his further views.

Mr. Houstoun presented for the Society's archives on behalf of Mr.

Charles R. Prinsep, two papers found amongst the papers of the late James Prinsep. The one a letter dated Dacca, 16th April, 1838, from L. R. Stacy to the late James Prinsep, on a sculpture, commemorative of Buddhist ascendancy, purchased near Muttra; the other paper was on the birth of Buddha by J. Low, and revised by him in Province Wellesley, in July, 1837; both papers being understood to be the manuscripts of communications published by the Society.

Mr. Honstoun stated he had a great number of other papers which he proposed similarly presenting to the Society, as soon as the labours of other members, now engaged on them, enabled him to do so.

Mr. Houstoun brought to notice and presented to the Society a copy of a paper by Mr. H. T. Prinsep, proposing the publication, by the two principal Pandits of the late J. Prinsep, in a work as particularized in the paper; all the inscriptions of Asia already published or remaining to be published by the Asiatic Society or elsewhere as far as obtainable, and gave notice that he would at the next meeting move:

1. To be informed if the original paper was with the Society, and if so, that it be produced and published in memory of the high services and eminent attainments of the late J. Prinsep and in compliment to his family, and as a step towards obtaining the co-operation of the public to Mr. H. T. Prinsep's object, as many parties would gladly aid in that object; and he further called for the production of any traces there might be of any such paper, if the original were not with the Society or to be found, as his copy appeared to have been taken from an unrevised draft; and asked for a statement of the step that had been taken in consequence of, or any way appertaining to, the object of that paper, and also proposed that the particular aid he would specify and every aid, inducement and encouragement, be given to the only surviving one of the two pandits to undertake such a work, and to any one else if that party cannot now undertake it.

2. For the production of all Mr. Heatly's unpublished contributions towards the development of the mineral resources of India, and a list of all unpublished MSS. in the Society's possession, and

that the whole of all such manuscripts be made accessible to the members during the hours prescribed for the attendance of the Librarian and other servants of the Society.

3. To ask what had been done in consequence of an intimation he understood to have been circulated some years ago amongst the members of the Society, regarding the publication of fresh maps of the Soonderbunds, and for the production of all papers given in by any one on that subject.

4. That all duplicates or supposed duplicate fossil and other remains in the Society's possession be offered to the Hon'ble the Court of Directors for their disposal, he understanding the Hon'ble Court to have expressed a wish for such, and at the same time to be informed who is individually responsible that proper measures are taken for the proper preservation of the fossil and other remains in the Society's possession, considering a joint responsibility, no security at all that such remains will be properly taken care of, constant complaints being made that the Society's property is not cared for as it should be.

5. That the whole of the fossil and other remains be placed under the sole charge and responsibility of the Curator of Economic Geology, as appertaining to his Department, and the Curator be called upon to report, after consultation with competent parties, what measures he would require to be taken to secure the proper preservation of the whole of those relics, and, especially, what is considered the best coating for preserving them, and fossil shells and bones, and teeth of mammalia, and whether a coating with a mucilage of gum tragacanth is not the best and a sufficient means of preserving such relics, if they are first saturated with it.

Communications were received—

1. From Dr. Wright, enclosing the following particulars of a luminous appearance of the sea in Lat. $11^{\circ} 27'$; Long. $105^{\circ} 40'$ E. observed on Thursday the 27th of July, 1854.

Hong Kong, June 6th, 1855.

To the Secretary of the Asiatic Society.

DEAR SIR,—A short time since, I had an opportunity of examining some Nos. of your Journal and find (Journ. No. II. 1854 p. 206,) that you solicit farther notices of such phenomena as Capt. Bowen has given

you on the preceding page. Accordingly I send you the following copy of notes taken immediately after witnessing the phenomena they describe.

Ship "Shooting Star" bound from N. Y. to Hong Kong. Thursday, July 27th, 1854. Lat. $11^{\circ} 27'$ N.; Long. $105^{\circ} 40'$ E.

$7\frac{3}{4}$ P. M. A little cloudy on the horizon, but very clear, bright star-light, fresh breeze. Air 73° F. Ship entered light colored water, and in about 15 minutes, the sea as far as the eye could reach, appeared like an immense field of snow, no ripples, but smooth like oil, so that when the ship's bows threw up a ripple it immediately fell back to its former level. Orders were given to heave the lead, when 60 fathoms found no bottom. The light from the water illuminated objects on deck and dimmed all stars within 20° of the horizon. Looking over the widest part of it, the horizon appeared like a dim Aurora Borealis. Ship's head North. Sailed 13 miles through this patch, then $\frac{1}{2}$ a mile through ordinary colored seawater, and again through another patch of 10 miles of light water: limits of light water, well defined.

Dipped up deck a tub full of this water, and found it $78\frac{1}{2}^{\circ}$, same as water in the morning. The tub presented a brilliant sight, being filled with bright self-luminous serpentine animalculæ, varying from half an inch to five inches in length. Examined carefully in the hand, by the light, they were found to be nearly transparent, about the size of a hair in the middle, and tapering a little towards each end; of a jelly-like substance which burnt in the candle with a red light, and crisped like burnt whalebone. A few were differently formed. Two were found capable of propelling themselves through still water in a tumbler. One of these was in the form of a concentric ring half an inch in diameter, with teeth-like projections on the inner edge, and seemed to propel itself by contracting the diameter of the ring: it was preserved alive about 36 hours.

This examination satisfied me that the light is emitted by animalculæ, but I am most anxious to know if scientific men can explain *why* it appears at *certain times* and within such *prescribed limits*.

Your's truly,

A. R. WRIGHT,

Surgeon, P. and O. Co's.

S. S. "LADY MARY WOOD."

2. From Mr. Secretary Melville, India House, stating that the Hon'ble the Court of Directors have acceded to the Society's request for a set of casts of Indian Fossils in the India House Museum, and

directed Dr. Horsefield to prepare and forward the same to the Society's Agents in London.

3. From E. Thomas, Esq. forwarding a paper entitled "On the Epoch of the Gupta King."

4. From Bábu Rádhánáth Sikdár, enclosing abstracts of Meteorological Registers kept at the Surveyor General's Office, Calcutta, for the month of April last.

The Librarian submitted his usual monthly report.

Captain Thuillier then, on the invitation of the Chairman, explained to the meeting what had led to the Mission of the brothers Schlagintweit to the Himalayas—reading extracts from letters recently received from Mr. Adolphe Schlagintweit and showing the route by which he and his brother Robert had reached Milney in North Kemaon.

Confirmed 5th September, 1855.

R. G. GHOSE, V. P.

LIBRARY.

The following additions have been made to the Library since the last meeting.

Presented.

Die Lieder des Hafis. Persisch mit dem Commentaire des Sudi, Herausgegeben von H. Brockhaus. 1 en bandes 1 es heft.—BY THE EDITOR.

Natuurkundig Tijdschrift voor Nederlandsch Indie, Deels VIII. et VI. aflevering I. et II.—BY THE EDITOR.

Papers regarding the cultivation of Hemp in India, *Agra*, 1855, 8vo. pamphlet.—BY THE GOVERNMENT OF THE NORTH WESTERN PROVINCES.

Selections from the Records of the Government of the North Western Provinces, No. XX.—BY THE SAME.

Selections from the Public Correspondence of the Punjab Administration, No. XI. 4 copies.—BY THE CHIEF COMMISSIONER.

Selections from the Records of the Madras Government, No. V.—BY THE GOVERNMENT.

Selections from the Records of the Bengal Government, No. XX.—BY THE GOVERNMENT OF BENGAL.

Report on the Administration of the Salt Department of the Revenue of Bengal, for the year 1853-4.—BY THE SAME.

The Journal of the Indian Archipelago, from Oct. 1854 to March, 1855, 2 copies each.—BY THE SAME.

The Oriental Christian Spectator, for May and June, 1855.—BY THE EDITOR.

The Oriental Baptist, No. 102.—BY THE EDITOR.

The Calcutta Christian Observer, for June, 1855.—BY THE EDITORS.

Zeitschrift der Deutschen morgenländischen Gesellschaft IX. Band II. heft.—BY THE EDITOR.

The Upadeshak, No. 102.—BY THE EDITOR.

Bibidhārtha Sangraha, No. 36.—BY THE EDITOR.

Recueil des Actes de l'Académie impériale des Sciences de Bordeaux, Nos. 1-2 of 1854.—BY THE ACADEMY.

The Durbeen, a Persian newspaper, for June and July, 1855.—BY THE EDITOR.

Exchanged.

The Calcutta Review, for July, 1855.

The Athenæum, for April and May, 1855.

Journal Asiatique, October, 1855.

Journal of the Agri-Horticultural Society of India, p. 1. Vol. IX,

The Philosophical Magazine and Journal of Science, March and May, 1855.

Purchased.

The North American Review, No. 167.

The Westminster Review, No. XIV.

The Quarterly Review. No. for April, 1855.

The Edinburgh Review. No. for April, 1855.

The Annals and Magazine of Natural History, Nos. 87-88.

The Literary Gazette, Nos. 1981 @ 1999.

Revue des Deux Mondes, 1er Mai, 1855.

L'Athenæum Français, 5 Mai, 1855.

Kaivalyanvanita, A Vedanta Poem: the Tamil Text with a Translation or Glossary, and Grammatical Notes; to which is added, an Outline of Tamil Grammar, with specimens of Tamil structure, and comparative Tables of the Flexional system in other Dravida languages, by C. Græul, London, 1853, 8vo.

Journal des Savants, Fevr. Mars. et April, 1855.

Comptes Rendus, Nos. 3—18 except 14.

The Mahābhārata translated into Bengali by Kāsirām Dāsa, Purnachandrodaya Press, 1 vol. 8vo.

The Sabdāmbudhi, a Bengali Dictionary, 1 vol. 8vo.

Addy's Anglo-Bengali Dictionary, 1 vol. 8vo.

—— Translation of the Arabian Nights, 1 vol.

The Shah-nameh, translated into Bengali by Bisweswar Datta, 1 vol. 8vo.
 Baidyanáth Banerjea's History of Hindustan, in Bengali 1 vol. 8vo.

The Chaitanya Chandrodaya Náatak, in Bengali, 1 vol.

Panjábetihása, or a History of the Punjab, in Bengali 1 vol. 8vo.

Shyámácharan's Bengali Grammar, in Bengali 1 vol. 8vo.

Rákháldás Háldar's History of Ráma, in Bengali 12mo.

Macauley's Life of Lord Clive, translated into Bengali, by Hurchunder Dutt, 1 vol. 12mo.

Manatattwasára, or Combe's Principles of Phrenology, in Bengali 12mo.

Encyclopædia Bengalensis, 12 vols. 12mo.

A Narrative of the Persecution of the Christians in Madagascar with details of the escape of the six Christian Refugees now in England. By J. J. Freeman and D. Johns, *London*, 1840, 12mo.

Journal of a March from Delhi to Peshawar, and from thence to Cabul with the Mission of Lt.-Col. Sir C. M. Wade. By Lt. W. Barr. *London*, 1844, 12mo.

Narrative of a Mission to Bokhara in the years 1843-45, to ascertain the fate of Colonel Stoddard and Capt. Conolly. By the Rev. J. Wolff, *London*, 1844, 8vo. 2 vols.

Journal of an Embassy from the Governor-General of India to the Courts of Siam and Cochin China, exhibiting a view of the actual state of those kingdoms; by John Crawford. Second Ed. *London*, 1830, 8vo 2 vols.

Travels in Circassia, Krim, Tartary, &c. including a steam voyage down the Danube from Vienna to Constantinople, and round the Black Sea. By E. Spencer. Third Ed. *London*, 1839, 2 vols. 8vo.

Travels and Researches in Asia Minor, Mesopotamia, Chaldea and Armenia, by W. F. Ainsworth, *London*, 1842, 2 vols. post 8vo.

The History of Bahawalpur with notices of Sindh, Afghanistan, Multan, and the West of India, by Shahámet Ali. *London*, 1843, post 8vo.

Voyages of the Dutch Brig of War 'Dourga,' through the southern and little-known parts of the Moluccan Archipelago, and along the previously unknown South Coast of the New Guinea, performed during the years 1825-26, by D. H. Kolff, Junr. Translated from the Dutch by G. W. Earl. *London*, 1840, 8vo.

Memoir of the Countries about the Caspian and Aral seas, illustrative of the Late Expedition against Khiah. Translated from the German of C. Temmermanu, by Capt. Morier. *London*, 1840, 8vo.

Personal observations on Sindh, the Manners and Customs of its Inhabitants and its Productive Capabilities. By T. Postans. *London*, 1843, 8vo.

Western India : Reports addressed to the Chambers of Commerce of Manchester, Liverpool, Blackburn and Glasgow, by N. A. Mackey. Edited by J. Robertson, Esq. *London*, 1853, 8vo.

Travels in Luristan and Arabistan, by Baron C. A. de Bode. *London*, 1845, 2 vols. 8vo.

Narrative of a Whaling Voyage round the Globe, from the year 1833 to 1836, comprising sketches of Polynesia, California, the Indian Archipelago. &c., by F. O. Bennett, *London*, 1840, 2 vols. 8vo.

RA'JENDRALA'L MITTRA.

27th July, 1855.

FOR SEPTEMBER, 1855.

At the usual monthly general meeting of the Society held on the 5th instant, at half-past 8 P. M.

BÁBU RÁMGOPÁL GHOSE, Vice-President, in the chair.

The proceedings of the last meeting were read and confirmed.

Presentations were received—

1. From Bábu Rámchandra Mittra, Secretary Bethune Society. Selections from the Bethune Society's Papers, Nos. I. II.
2. From Bábu Rádhánáth Sikdár, Masik Patriká, Nos. 10. to 12.
3. From J. Bedford, Esq. Geological specimens from the copper mines and Geysers of New Zealand.
4. From Capt. C. B. Young, 1st, Specimen of a New Zealand caterpillar, 2nd, Specimen of Kauri gum from New Zealand, and 3rd, the orbiculare bone of a whale's ear.

The following are extracts from Capt. Young's letter and the notes therein alluded to :

"I send you what, I believe, may be new to the Society, and if put on the table at our meeting may elicit some remarks and serve to interest, viz. : a specimen of the grass-tree caterpillar from Australia, whose conversion into woody substance is very curious. It is mentioned by Hooker ; a few lines on the subject accompany, which were written by the gentleman who brought the specimen, Mr. F. M. Hind, B. C. S.

"I also send a specimen of the Kauri gum with a few remarks

from the same gentleman. This is doubtless nothing new, but its mode of formation and collection, which I have also heard of from other visitors to Australia, is interesting and peculiar.

“Lastly, what the Society may perhaps not have in their Museum the bone of a whale’s ear picked up at the Cape.”

“The caterpillar known as the grass-tree caterpillar burrows, at one portion of its existence, in the Púriri tree, and it is there supposed to contract a disease or rather to become inoculated with the seed of a peculiar grass, which eventually grows out of its head. The animal lives for a time, during which it is supposed that its animal substance is absorbed by the plant, and replaced by another substance identical with the plant itself; when this process has advanced to a certain stage the animal dies, but the process of absorption of animal matter and replacement of vegetable continue until the entire caterpillar has been converted into a ligneous substance. All caterpillars are not so diseased, in fact, those specimens found with the grass growing out of them are exceptions. I have always understood that these are dug out of the ground.

“One or two specimens of the cricket-genus have also been discovered so diseased—but they are very rare.

“The grass-tree caterpillar is only found in certain localities of New Zealand.”

“The Kauri gum is found under ground and marks the site of a departed Kauri tree. I have found large lumps of the gum in plains far distant from any forest; and it is generally supposed that places where the gum is found have been forests destroyed by fire. I presume it is the action of the fire which drives the sap of the tree towards the roots, and forms it into the hard substance known as Kauri gum. The wood of the tree burns readily, and time would soon obliterate all signs of the conflagration.

“I have never seen Kauri gum in a living tree.”

5. From Dr. Thompson, on behalf of self and Dr. Hooker, a copy of *Flora Indica*, Vol. I.

Recorded a note from Bábu Kissory Chand Mittra, communicating his wish to withdraw from the Society.

Mr. Houstoun did not make the motion of which he gave notice at the last meeting.

The chairman announced to the meeting that Mr. Grote had resigned his post as Secretary to the Society, and that the Council have permitted Mr. H. V. Bayley a member of their body, to hold the office temporarily till the 1st October, unless a successor can be appointed before.

The chairman then, advertng, in some detail, to the valuable services rendered to the Society by Mr. Grote, proposed "that this meeting receive with regret the resignation of Mr. Grote as Secretary of the Society and Editor of the Journal, and that it desires to record its grateful sense of the distinguished zeal and ability with which he has so long discharged the arduous duties of his office."

The resolution was seconded by Mr. Allen.

Capt. Thuillier proposed as an amendment:

"That this meeting have learned with great regret of the sudden determination of Mr. Grote to resign the appointment of Secretary to this Society, and request that he be solicited to waive that determination, and to continue the benefit of his valuable services to the Society."

The Hon'ble F. Drummond seconded the amendment.

Dr. Thompson moved "that the resolution be postponed till the next meeting, in order, that the papers connected with Mr. Grote's resignation may be laid before the Society to enable them to come to a decision in a matter so deeply to be regretted."

On being put to the vote Dr. Thompson's proposition was lost and the first amendment carried.

Communications were received—

1. From the Secretary to the Government of the North-Western Provinces, enclosing copy of a Meteorological Register kept at the Office of the Secretary at Agra, for the months of June and July last.

2. From G. R. Freeling, Esq. submitting an Index to all the numismatic papers published in the Journal of the Society.

3. From Bábu Rádhánáth Sikdár, forwarding abstracts of Meteorological Observations taken at the Surveyor General's Office, in the months of May and June last.

The Librarian submitted his usual monthly report of additions made to the library during the month of July last.

On the conclusion of the regular business of the evening, Mr. Houstoun handed in the following protest:

"I protest against the assumption of the chair by the Chairman on the grounds of his being a Vice-President of the Society, having already protested that no Council has been elected."

Confirmed 3rd Oct. 1855.

RAMGOPAUL GHOSE, V. P.

LIBRARY.

The library has received the following valuable accession to its stores since the last meeting.

Presented.

Memorie della Reale Accademia delle Scienze di Torino, I series, vols. 1 to 6 and 12 to 40, and ii. series, vols. 1 to 12 (2 copies of the last) and 14.—BY THE ROYAL ACADEMY OF TURIN.

Ramayana poema Indiano di Valmici testo sanscrito secondo i codici manoscritti della scuola Gaudana per Gaspere Gorresio. Parigi, 1844 to 1853, 8 vols.—BY THE SAME.

Fisica de' corpi Ponderabili ossia trattato della costituzione generale de' corpi del cavaliere Amedeo Avogadro. Torino, 1837, 4 vols. 8vo.—BY THE SAME.

Melanges de Philosophie et de Mathematique de la Société royale de Turin. Turin, 1759-73, 5 vols. demi 4to.—BY THE SAME.

Museo Numismatico Lavy appartenente alla Reale Accademia delle Scienze di Torino. Torino, 1840, 2 vols. 4to.—BY THE SAME.

Flora Sordoa seu Historia Plantarum in Sardinia et Adjacentibus insulis vel sponte nascentium vel ad Utilitatem latius excultarum auctore J. H. Moris. Taurini, 1837, 3 vols. 4to.

Analyse grammaticale Raisonnée de differens textes anciens Egyptiens par F. Salvolini, vol. I. Paris, 1836, 8vo.—BY THE SAME.

Essai d'un Parallèle entre les Forces physique et les Forces morales par H. Carena. Turin, 1817, 8vo.—BY THE SAME.

Dizionario Militare Italiano di G. Grassi. Torino, 1817, 2 vols. 8vo.—BY THE SAME.

Rapporto e Osservazione interno alla cura dei Fanciulli Cretini. Torino, 1854, 4to.—BY THE SAME.

Elementi di Storia naturale Generale di Euginio Sismonda. Torino, 1853, 12mo.—BY THE AUTHOR.

Notizia Storica dei Savori fatte dalla classe di Scienze Fissiche e Mathematique nel Corso degli' anno 49 et 53 par E. Sismonda. Torino, 1851-53, 4to.—BY THE AUTHOR.

Osteografia di un Mastodonte augustidente illustrato del E. Sismonda. Torino, 1851, 4to.—BY THE AUTHOR.

Natuurkundig Tijdschrift voor Nederlandsch Indië. Deel, IV. Nos. III, IV.—BY THE EDITORS.

Selections from the Records of the Madras Government, No. IX. Reports on Important Public Works, for 1851.—BY THE BENGAL GOVERNMENT.

Selections from the Records of the Government of Bengal, No. XIII. Correspondence relating to Suppression of Dacoity in Bengal.—BY THE SAME.

The Calcutta Christian Observer, for August, 1855.—BY THE EDITORS.

Address at the Anniversary Meeting of the Royal Geographical Society, 22nd May, 1844. By the Earl of Ellesmere.—BY THE SOCIETY.

Proceedings of the Royal Society, No. 13.—BY THE SOCIETY.

Journal Asiatique, No. 19.—BY THE SOCIÉTÉ ASIATIQUE.

The Oriental Christian Spectator, for July, 1853.—BY THE EDITOR.

Flora Indica, being a Systematic Account of the Plants of British India, together with Observations on the structure and affinities of their Natural Orders and Genera, by J. D. Hooker and J. T. Thompson, vol. I. London, 1855, 8vo.

Exchanged.

The London, Edinburgh and Dublin Philosophical Magazine, No. 61, June, 1853.

Athæneum, for May 1855.

Purchased.

Annals des Sciences naturelles. Paris, 1855, Tome III. No. 1.

Revue et Magazin de Zoologie par G. Meneville, No. 4.

Annals and Magazine of Natural History, No. 90.

Journal des Savants, for May, 1855.

Comptes Rendus, Nos. 19 to 23.

Bulletin archæologique de l'Athenæum français, Nos. 1, 4 and 5.

L'Athenæum français, Nos. 1, 6, 10, 11, 12, 13, 15, 16, 17, 19, 20, 21, 22 and 23.

The Literary Gazette, 2000, 1, 2 and 3.

Zendavesta or the Religious Books of the Zoroastrians, edited and interpreted by N. L. Westergaard, vol I. p. iv.

Memoirs of the Life, Writings and Correspondence of Sir William Jones, by the Hon'ble Lord Teignmouth, with the Life of Lord Teignmouth. Selections from Sir William Jones's works, and occasional notes, by the Rev. J. C. Wilks, London, 1835, 2 vols. 12mo.

1st Sept. 1855.

RA'JENDRALA'L MITTRA.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1855.*

Latitude 22° 33' 1" North. Longitude 88° 20' 34" East.

Height of the cistern of the Standard Barometer above the level of the Sea, 18.11 feet.

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempe- rature during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.649	29.723	29.566	0.157	87.8	97.7	81.4	16.3
2	.634	.692	.577	.115	87.5	96.6	80.6	16.0
3	.722	.789	.647	.142	86.4	92.9	81.6	11.3
4	.757	.828	.676	.152	86.3	92.8	82.2	10.6
5	.681	.749	.596	.153	85.8	91.9	80.6	11.3
6	<i>Sunday.</i>							
7	.618	.682	.556	.126	87.4	95.4	82.6	12.8
8	.654	.721	.579	.142	87.1	92.8	83.3	9.5
9	.736	.791	.691	.100	86.4	92.9	82.2	10.7
10	.687	.733	.562	.171	84.6	91.2	77.8	13.4
11	.631	.689	.593	.096	85.2	91.0	80.2	10.8
12	.649	.717	.596	.121	84.9	88.9	80.7	8.2
13	<i>Sunday.</i>							
14	.701	.781	.620	.161	87.8	94.6	83.0	11.6
15	.714	.753	.641	.112	83.2	94.4	72.3	22.1
16	.738	.805	.658	.147	81.0	89.9	73.6	16.3
17	.721	.791	.640	.151	83.3	93.6	74.9	18.7
18	.647	.731	.515	.216	83.4	93.3	73.6	19.7
19	.549	.601	.476	.125	87.3	94.4	81.2	13.2
20	<i>Sunday.</i>							
21	.640	.695	.587	.108	88.2	95.4	82.0	13.4
22	.642	.720	.580	.140	88.5	97.4	82.3	15.1
23	.624	.702	.557	.145	90.0	98.1	83.3	14.8
24	.605	.681	.492	.189	89.7	100.1	80.4	19.7
25	.581	.655	.497	.158	87.4	97.2	79.4	17.8
26	.598	.664	.535	.129	88.2	97.5	81.6	15.9
27	<i>Sunday.</i>							
28	.503	.590	.424	.166	77.5	81.2	75.0	6.2
29	.594	.672	.508	.164	82.3	89.5	74.0	15.5
30	.663	.720	.614	.106	84.7	92.4	78.2	14.2
31	.600	.661	.529	.132	87.2	92.9	83.3	9.6

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1855.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Va- pour in a Cubic foot of Air.	Additional weight of vapour required for complete saturation.	Mean degree of Hu- midity complete sa- turation being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	82.3	5.5	79.5	8.3	0.986	10.49	3.11	0.771
2	82.4	5.1	79.8	7.7	.995	.58	2.91	.784
3	81.9	4.5	79.6	6.8	.989	.54	.52	.807
4	81.3	5.0	78.8	7.5	.964	.27	.75	.789
5	81.2	4.6	78.9	6.9	.967	.32	.51	.804
6	<i>Sunday.</i>							
7	82.3	5.1	79.7	7.7	.992	.55	.90	.784
8	81.7	5.4	79.0	8.1	.970	.33	3.00	.775
9	81.5	4.9	79.0	7.4	.970	.35	2.71	.793
10	80.6	4.0	78.6	6.0	.958	.26	.13	.828
11	81.2	4.0	79.2	6.0	.976	.43	.18	.827
12	81.1	3.8	79.2	5.7	.976	.43	.06	.835
13	<i>Sunday.</i>							
14	82.4	5.4	79.7	8.1	.992	.55	3.05	.776
15	78.1	5.1	75.5	7.7	.868	9.31	2.58	.783
16	77.5	3.5	75.7	5.3	.873	.41	1.73	.845
17	78.8	4.5	76.5	6.8	.896	.61	2.32	.806
18	78.9	4.5	76.6	6.8	.899	.63	.33	.805
19	82.7	4.6	80.4	6.9	1.014	10.79	.62	.805
20	<i>Sunday.</i>							
21	82.8	5.4	80.1	8.1	.005	.67	3.09	.775
22	83.3	5.2	80.7	7.8	.024	.86	.02	.782
23	83.7	6.3	80.5	9.5	.017	.76	.74	.742
24	83.1	6.6	79.8	9.9	0.995	.54	.83	.733
25	82.3	5.1	79.7	7.7	.992	.55	2.90	.784
26	82.7	5.5	79.9	8.3	.998	.61	3.15	.771
27	<i>Sunday.</i>							
28	76.5	1.0	76.0	1.5	.882	9.56	0.48	.952
29	78.8	3.5	77.0	5.3	.910	.79	1.79	.845
30	81.7	3.0	80.2	4.5	1.008	10.77	.65	.867
31	84.0	3.2	82.4	4.8	.080	11.49	.88	.859

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1855.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Hour.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer for each hour during the Month.			Mean Dry Bulb Thermometer.	Range of the Temperature for each hour during the Month.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
Mid-night.	29.658	29.754	29.543	0.211	82.3	86.5	74.2	12.3
1	.643	.739	.528	.211	81.8	86.1	74.0	12.1
2	.634	.736	.508	.228	81.5	85.5	74.0	11.5
3	.631	.735	.523	.212	81.3	85.0	73.8	11.2
4	.634	.746	.509	.237	81.0	84.2	73.6	10.6
5	.645	.786	.498	.288	80.9	84.4	73.6	10.8
6	.663	.812	.496	.316	81.0	84.0	73.9	10.1
7	.684	.822	.487	.335	82.1	85.6	74.9	10.7
8	.700	.810	.537	.273	84.2	87.7	77.2	10.5
9	.710	.828	.543	.285	86.5	90.6	77.4	13.2
10	.708	.823	.540	.283	88.8	93.8	78.0	15.8
11	.696	.817	.539	.278	90.5	95.6	78.4	17.2
Noon.	.679	.812	.488	.324	91.9	97.2	78.2	19.0
1	.657	.773	.462	.311	92.6	98.2	77.6	20.6
2	.632	.738	.452	.286	93.0	100.0	77.4	22.6
3	.610	.717	.461	.256	93.1	100.1	78.4	21.7
4	.591	.707	.436	.271	92.2	100.1	79.0	21.1
5	.585	.705	.424	.281	90.4	98.7	79.6	19.1
6	.602	.740	.443	.297	87.8	96.6	72.3	24.3
7	.620	.768	.450	.318	85.5	91.6	75.8	15.8
8	.635	.745	.470	.275	84.1	90.7	74.5	16.2
9	.649	.759	.505	.254	82.9	88.4	74.2	14.2
10	.661	.776	.533	.243	82.9	88.6	74.9	13.7
11	.662	.760	.544	.216	82.5	87.7	74.8	12.9

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1855.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Hour.	Mean Wet Bulb Thermo- meter.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional Weight of Va- pour required for com- plete saturation.	Mean degree of Humidity complete saturation be- ing unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid- night.	79.6	2.7	78.2	4.1	0.946	10.17	1.41	0.878
1	79.5	2.3	78.3	3.5	.949	.20	.20	.895
2	79.5	2.0	78.5	3.0	.955	.29	.02	.910
3	79.3	2.0	78.3	3.0	.949	.22	.02	.909
4	78.9	2.1	77.8	3.2	.934	.07	.07	.904
5	78.9	2.0	77.9	3.0	.937	.10	.00	.910
6	79.1	1.9	78.1	2.9	.943	.16	0.98	.912
7	79.8	2.3	78.6	3.5	.958	.30	1.21	.895
8	81.0	3.2	79.4	4.8	.983	.51	.73	.859
9	82.0	4.5	79.7	6.8	.992	.57	2.53	.807
10	83.0	5.8	80.1	8.7	1.005	.64	3.36	.760
11	83.6	6.9	80.1	10.4	.005	.62	4.10	.721
Noon.	84.1	7.8	80.2	11.7	.008	.62	.70	.693
1	84.6	8.0	80.6	12.0	.021	.75	.88	.688
2	84.6	8.4	80.4	12.6	.014	.66	5.15	.674
3	84.6	8.5	80.3	12.8	.011	.63	.23	.670
4	83.8	8.4	79.6	12.6	0.989	.41	.04	.674
5	83.2	7.2	79.6	10.8	.989	.45	4.22	.712
6	81.9	5.9	78.9	8.9	.967	.28	3.32	.756
7	80.9	4.6	78.6	6.9	.958	.23	2.49	.804
8	80.2	3.9	78.2	5.9	.946	.13	.03	.830
9	79.4	3.5	77.6	5.3	.928	9.97	1.82	.846
10	79.4	3.5	77.6	5.3	.928	.97	.82	.846
11	79.5	3.0	78.0	4.5	.940	10.09	.55	.867

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of May, 1855.*

Solar radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	133.0		S.	Cloudy till 10 A. M. cloudless afterwards.
2	139.0		S. or S. W. or S. E.	Cloudless.
3	133.4		S. or S. E. High.	Cloudless till 7 A. M. scattered clouds afterwards.
4	143.0		S. E. or S. High.	Cloudy.
5	130.4		S. Sharp.	Cloudy nearly the whole day.
6	Sunday.			Sunday.
7	135.0		S. E. or S. High.	Cloudy till 10 A. M. cloudless till 6 P. M. scattered clouds afterwards.
8	131.1		s. or s. w. or E. High.	Cloudy the whole day, also drizzling at 9 P. M.
9	132.0		S. or S. E.	Cloudy.
10	..		S. E. or S. or E. High.	Ditto.
11	125.0	0.33	S. High.	Ditto.
12	..		S.	Ditto.
13	Sunday.			Sunday.
14	140.1		S. Sharp.	Scattered ci.
15	133.5	0.55	S. or S. E. High.	Cloudy and constantly drizzling.
16	127.5		S. E. or N. E. or E.	Cloudless till 9 A. M. cloudy afterwards.
17	140.6	0.51	E. or S. E. or S.	Cloudy or scattered ci.
18	130.4		E. or N. E. or S.	Cloudless till 10 A. M. scattered ci afterwards.
19	141.5		S.	Cloudless nearly the whole day.
20	Sunday.			Sunday.
21	127.9		S.	Cloudless till 9 A. M. scattered ci till 5 P. M. cloudless afterwards.
22	136.0		S. or S. S. W.	Cloudless till 7 A. M. scattered ci afterwards.
23	142.8		Calm or S. or S. E.	Cloudless till 7 A. M. scattered ci afterwards.
24	141.0	0.32	S. or E. or S. W.	Cloudless till 7 A. M. scattered ci afterwards.
25	133.0		S. or S. E.	Scattered ci till 6 P. M. cloudless afterwards.
26	130.0		S. E.	Cloudless till 5 A. M. scattered ci till 4 P. M. cloudy afterwards also drizzling at 11 P. M.
27	Sunday.			Sunday.
28	..	3.70	W. or W. S. W.	Cloudy and constantly raining.
29	133.0	0.37	S. Sharp.	Cloudy.
30	124.0		S. or S. W.	Ditto.
31	123.0	0.18	S. or S. E.	Ditto.

ci Cirri, ci Cirro-strati, ci Cumuli, ci Cumulo-strati, ni Nimbi, —i Strati, ni Cirro-cumuli.

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of June, 1855.*

Latitude 22° 33' 1" North, Longitude 88° 20' 34" East.

Height of the Cistern of the Standard Barometer above the Level of the Sea 18.11. feet

Daily Means, &c. of the Observations, and of the Hygrometrical elements
dependent thereon.

Date.	Mean Height of the Barometer at 32° Fahr.	Range of the Barometer during the day.			Mean Dry Bulb Thermometer.	Range of the Tempera- ture during the day.		
		Max.	Min.	Diff.		Max.	Min.	Diff.
	Inches.	Inches.	Inches.	Inches.	°	°	°	°
1	29.544	29.616	29.478	0.138	88.2	93.7	84.2	9.5
2	.549	.592	.507	.085	88.3	94.8	82.0	12.8
3	<i>Sunday.</i>							
4	.568	.626	.508	.118	88.4	96.1	81.0	15.1
5	.555	.611	.473	.138	88.1	93.6	83.7	9.9
6	.511	.590	.439	.151	89.6	97.8	83.6	14.2
7	.454	.503	.397	.106	88.4	96.4	84.3	12.1
8	.479	.559	.423	.136	83.3	90.2	78.7	11.5
9	.561	.612	.493	.119	83.4	90.3	78.4	11.9
10	<i>Sunday.</i>							
11	.553	.616	.473	.143	88.8	95.8	84.2	11.6
12	.543	.599	.500	.099	88.4	95.9	84.0	11.9
13	.545	.609	.482	.127	88.3	96.4	83.4	13.0
14	.586	.678	.529	.149	85.0	97.2	78.8	18.4
15	.641	.687	.603	.084	81.8	87.0	77.1	9.9
16	.613	.669	.539	.130	85.5	91.5	81.1	10.4
17	<i>Sunday.</i>							
18	.639	.691	.601	.090	82.7	86.4	80.1	6.3
19	.611	.653	.545	.108	82.1	84.2	79.8	4.4
20	.606	.645	.562	.083	82.5	85.6	79.0	6.6
21	.656	.712	.610	.102	83.0	86.8	80.4	6.4
22	.668	.716	.604	.112	85.6	91.6	80.3	11.3
23	.616	.677	.533	.144	86.5	91.6	82.7	8.9
24	<i>Sunday.</i>							
25	.577	.639	.508	.131	86.8	94.7	81.6	13.1
26	.534	.596	.460	.136	87.4	93.4	82.8	10.6
27	.475	.515	.412	.103	83.2	90.0	80.0	10.0
28	.477	.519	.405	.114	84.3	91.3	80.4	10.9
29	.468	.508	.419	.089	83.2	88.8	81.0	7.8
30	.439	.479	.386	.093	83.6	87.6	80.8	6.8

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of June, 1855.*

Daily Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Date.	Mean Wet Bulb Ther- mometer.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a cubic foot of air.	Additional weight of Va- pour required for com- plete saturation.	Mean degree of Humi- dity, complete satura- tion being unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
1	84.4	3.8	82.5	5.7	1.083	11.50	2.26	0.836
2	84.3	4.0	82.3	6.0	.077	.44	.36	.829
3	<i>Sunday.</i>							
4	83.7	4.7	81.3	7.1	.043	.08	.76	.801
5	83.9	4.2	81.8	6.3	.060	.26	.46	.821
6	84.4	5.2	81.8	7.8	.060	.22	3.11	.783
7	84.1	4.3	81.9	6.5	.063	.28	2.56	.815
8	81.0	2.3	79.8	3.5	0.995	10.66	1.27	.894
9	80.1	3.3	78.4	5.0	.952	.21	.75	.854
10	<i>Sunday.</i>							
11	84.5	4.3	82.3	6.5	1.077	11.42	2.58	.816
12	83.8	4.6	81.5	6.9	.050	.15	.69	.806
13	83.9	4.4	81.7	6.6	.057	.21	.59	.812
14	81.1	3.9	79.1	5.9	0.973	10.40	.13	.830
15	79.4	2.4	78.2	3.6	.946	.17	1.23	.892
16	82.2	3.3	80.5	5.0	1.017	.87	.85	.855
17	<i>Sunday.</i>							
18	80.3	2.4	79.1	3.6	0.973	.45	.27	.892
19	80.8	1.3	80.1	2.0	1.005	.80	0.71	.938
20	80.0	2.5	78.7	3.8	0.961	.33	1.31	.887
21	80.5	2.5	79.2	3.8	.976	.48	.34	.887
22	81.3	4.3	79.1	6.5	.973	.38	2.38	.813
23	82.0	4.5	79.7	6.8	.992	.57	.53	.807
24	<i>Sunday.</i>							
25	81.2	5.6	78.4	8.4	.952	.15	3.06	.768
26	81.3	6.1	78.2	9.2	.946	.07	.38	.749
27	81.0	2.2	79.9	3.3	.998	.72	1.17	.902
28	81.1	3.2	79.5	4.8	.986	.55	.73	.859
29	80.7	2.5	79.4	3.8	.983	.54	.35	.886
30	81.1	2.5	79.8	3.8	.995	.66	.37	.886

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of June, 1855.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon.

Hour.	Mean Height of the Ba- rometer at 32° Fahr.	Range of the Barometer for each hour during the month.			Mean Dry Bulb Thermo- meter.	Range of the Temper- ature for each hour during the month.			
		Max.	Min.	Diff.		Max.	Min.	Diff.	
	Inches.	Inches.	Inches.	Inches.	°	°	°	°	
Mid- night.	} 29.571	29.677	29.469	0.208	83.2	86.4	78.4	8.0	
1		.561	.668	.445	.223	82.9	86.0	77.9	8.1
2		.550	.656	.433	.223	82.6	85.4	77.1	8.3
3		.542	.644	.429	.215	82.5	85.1	77.6	7.5
4		.542	.645	.423	.222	82.3	85.0	77.8	7.2
5		.546	.652	.429	.223	82.2	85.1	77.9	7.2
6		.566	.676	.435	.241	82.3	85.2	77.8	7.4
7		.580	.689	.447	.242	83.2	86.0	79.0	7.0
8		.591	.698	.470	.228	84.7	88.4	80.4	8.0
9		.600	.716	.474	.242	86.4	90.6	81.1	9.5
10		.601	.712	.479	.233	88.4	92.8	82.7	10.1
11		.591	.712	.459	.253	89.4	93.8	82.3	11.5
Noon.	.577	.698	.451	.247	90.3	95.6	81.4	14.2	
1	.558	.678	.428	.250	90.0	97.2	80.0	17.2	
2	.540	.655	.417	.238	89.7	97.6	79.8	17.8	
3	.521	.628	.399	.229	89.5	97.8	80.6	17.2	
4	.506	.611	.394	.217	88.9	97.3	79.5	17.8	
5	.503	.623	.392	.231	87.9	97.0	79.3	17.7	
6	.511	.641	.386	.255	86.7	94.0	79.2	14.8	
7	.528	.656	.402	.254	85.6	91.8	79.2	12.6	
8	.546	.678	.433	.245	84.6	90.2	79.2	11.0	
9	.565	.694	.452	.242	84.1	88.6	78.8	9.8	
10	.576	.691	.469	.222	83.7	87.2	79.0	8.2	
11	.577	.682	.469	.213	83.4	86.4	78.7	7.7	

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of June, 1855.*

Hourly Means, &c. of the Observations and of the Hygrometrical elements
dependent thereon. (Continued.)

Hour.	Mean Wet Bulb Thermo- meter.	Dry Bulb above Wet.	Computed Dew Point.	Dry Bulb above Dew Point.	Mean Elastic force of Vapour.	Mean Weight of Vapour in a Cubic foot of Air.	Additional weight of va- pour required for com- plete saturation.	Mean degree of Humidity, complete saturation be- ing unity.
	o	o	o	o	Inches.	T. gr.	T. gr.	
Mid- night.	80.8	2.4	79.6	3.6	0.989	10.60	1.29	0.892
1	80.8	2.1	79.7	3.2	.992	.66	.13	.904
2	80.8	1.8	79.9	2.7	.998	.72	0.96	.918
3	80.7	1.8	79.8	2.7	.995	.69	.95	.918
4	80.6	1.7	79.7	2.6	.992	.66	.92	.921
5	80.5	1.7	79.6	2.6	.989	.63	.91	.921
6	80.6	1.7	79.7	2.6	.992	.66	.92	.921
7	81.2	2.0	80.2	3.0	1.008	.81	1.08	.909
8	81.9	2.8	80.5	4.2	.017	.89	.53	.877
9	82.8	3.6	81.0	5.4	.034	11.03	2.03	.845
10	83.6	4.8	81.2	7.2	.040	.05	.79	.798
11	83.8	5.6	81.0	8.4	.034	10.96	3.29	.769
Noon.	84.1	6.2	81.0	9.3	.034	.94	.69	.748
1	83.7	6.3	80.5	9.5	.017	.76	.74	.742
2	83.6	6.1	80.5	9.2	.017	.78	.59	.750
3	83.7	5.8	80.8	8.7	.027	.87	.42	.761
4	83.2	5.7	80.3	8.6	.011	.71	.33	.763
5	82.8	5.1	80.2	7.7	.008	.71	2.93	.785
6	82.4	4.3	80.2	6.5	.008	.73	.45	.814
7	81.7	3.9	79.7	5.9	0.992	.59	.17	.830
8	81.4	3.2	79.8	4.8	.995	.64	1.75	.859
9	81.0	3.1	79.4	4.7	.983	.51	.70	.861
10	81.0	2.7	79.6	4.1	.989	.60	.47	.878
11	81.1	2.3	79.9	3.5	.998	.69	.27	.894

*Abstract of the Results of the Hourly Meteorological Observations
taken at the Surveyor General's Office, Calcutta,
in the month of June, 1855.*
Solar radiation, Weather, &c.

Date.	Max. Solar radiation.	Rain.	Prevailing direction of the Wind.	General Aspect of the Sky.
	o	Inches.		
1	124.0	..	S.	Cloudy.
2	126.5	..	S. E. or S.	Cloudy also rain at 8 P. M.
3	Sunday.	..	S. or E. or S. E. or S. W.	Sunday.
4	137.0	..	S. E. or E.	Cloudy.
5	122.7	..	E. or S. E. or S.	Thin clouds over the whole sky.
6	133.0	..	S. E. or S. or N. E.	More or less cloudy till 7 P. M. cloudless afterwards.
7	128.8	..	N. or E. or S. E.	Cloudless till 5 A. M. more or less cloudy afterwards.
8	..	..	S. E. or E.	Cloudy the whole day, with constant drizzling.
9	124.0	0.10	[or S. E.]	Cloudy.
10	Sunday.	..	S. (high occasionally)	Sunday.
11	131.4	..	S. E. (sharp before [sunrise) or S.	Cloudy till 1 P. M. scattered \ afterwards.
12	130.0	..	S. E. or S.	Cloudless till 5 A. M. various clouds afterwards.
13	132.0	..	S. E. or S. or E.	Cloudy.
14	130.0	1.11	S. W. or S. or E.	Cloudless till 5 A. M., cloudy afterwards with occasional rain.
15	128.9	0.93	S. E.	Cloudy and constantly drizzling or raining.
16	126.0	..	S. E.	Cloudy, also drizzling at 5 P. M.
17	Sunday.	..	S. E.	Sunday.
18	..	1.02	S. E.	Cloudy and constantly raining or drizzling.
19	..	0.13	S. E.	Overcast also raining at 5 and 6 A. M. and drizzling at 10 A. M.
20	..	..	S. E. or S.	Cloudy, also raining at 5 A. M. and drizzling at noon.
21	..	..	S.	Cloudy.
22	137.0	..	S. E. or S.	Cloudless till 8 A. M., more or less cloudy afterwards.
23	122.0	..	S.	Cloudy the whole day.
24	Sunday.	..	S. W. or S.	Sunday.
25	..	..	S. W. or W.	Cloudy the whole day.
26	127.0	..	S. E. or S.	Ditto.
27	..	1.61	S. E. or E.	Cloudy also constantly raining.
28	129.0	..	E. or N. E.	Cloudy also rain after sunset.
29	..	0.94	N. E. or E.	Cloudy also rain between 1 and 3 P. M.
30	..	..		Cloudy with occasional rain.

∇i Cirri, ∇i Cumuli, —i Strati, ∇i Cirro-cumuli, ∇i Cirro-strati, ∇i Cumulostrati, ∇i Nimbi.

Ancient Indian Numerals

No.	Numerals	Prinsep	Stevenson		
			Fractions	Old Indian	Satrap
1	-	७	-		५५
2	=	० ०	=		७००
3	≡ =-	५ २	≡	३३	५
4	५५५५५	५ ८		५५५५	५
5	५५५५५५	५ ५	५	५	५
6	५	∞		५	५
7	५ ५	५		५	-
8	५	५		-	५
9	५ ५	५ ५		५	५
10	∞ ५ ५ ५	५ ५		∞ ५ ५	५ ५ ५
20	० ०			० ०	
30	७ ७ ७			७	
40	५	<div style="border: 1px solid black; padding: 5px; text-align: center;"> Gupta Numerals </div>			
50	५				
60	५				
70	५				
80	५ ∞ ०	<div style="border: 1px solid black; padding: 5px;"> <div>Units - , , ५ ५ ५ ५ ५</div> <div>Tens ० ५ ५ ५ ५</div> <div>Hundreds ५</div> </div>			
90	५ ⊕ ५				
100	५ ~ Gupta	५ Sand		० ०	० ५ ५
200	५ ५				
1000	५ ५				५ ५

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